Service manual and parts list

317 - 101

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SINGLE NEEDLE FREE ARM INDUSTRIAL SEWING MACHINE WITH LOWER OSCILLATING (NON-DROP LIKE) FEED IN COMBINATION WITH NEEDLE AND UPPER FEED, FOR HEMMING

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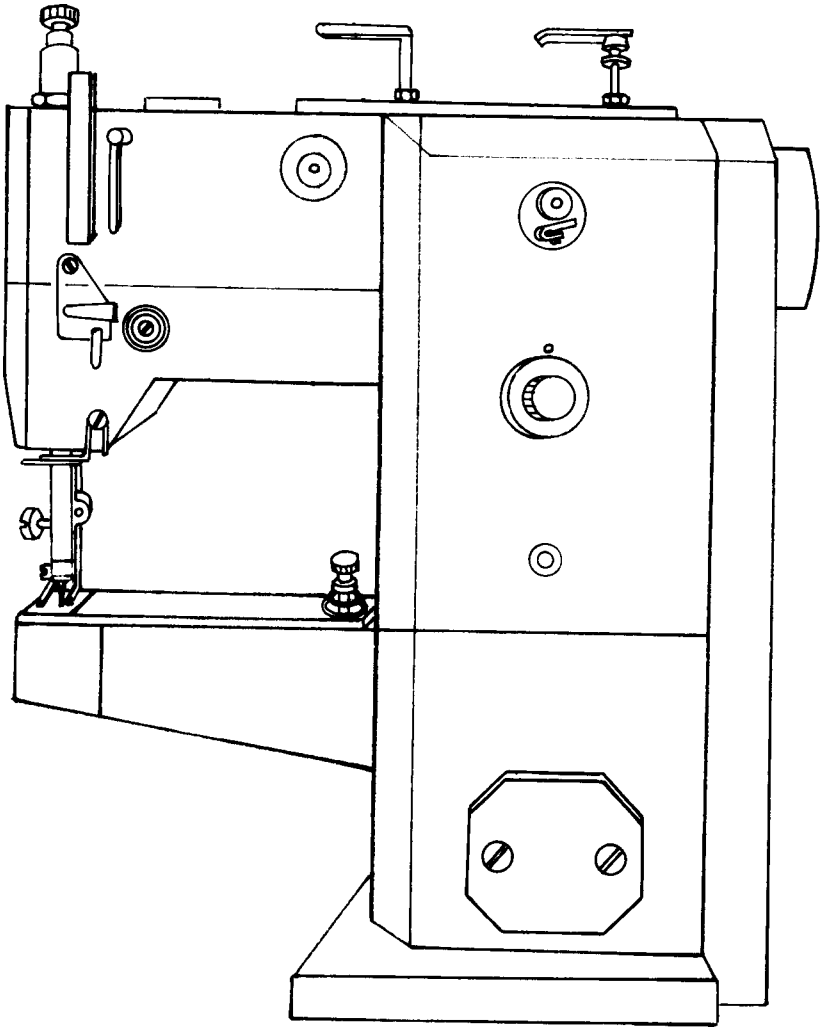


Use of Machine

The machine is used for hemming shoe uppers made of natural or artificial leather or of textile. The hemming material can be leather, textile, and plastic.

Specifications

Machine speed	3,000 stitches per min. at stitch length max. 4 mm 2,500 stitches per min. at stitch length 4 to 6 mm 2,500 stitches per min. with synthetic treads
Stitch type	two-thread lockstitch
Stitch length	0 to 6 mm for textile materials 0 to 4 mm for leather
Stitching	only forward (for bartacking, a hand lever can be ordered as Equipment No. 203)
Needle	134 R Spec. hard chromium plated, Nos. 90 - 120 123 x 5 Spec., hard chromium plated, Nos. 90 - 120 Schmetz 797 CFCF Nos. 90 - 120 134 LGR, hard chromium plated, Nos. 90 - 120
Cotton threads	29.5 tex x 3 - 14.5 tex x 3
Synthetic threads	PES 25 tex x 1 x 2; 25 tex x 1 x 3
Hook	C 235
Presser foot stroke	with hand lever 7.5 mm with treadle 9 mm
Thickness of sewn work	up to 4 mm for leather up to 6 mm for other materials
Stitching of transition sections (at reduced speed)	for leather sections thickened up to 5 mm, with height difference of 2 mm for textile sections thickened up to 8 mm, with height difference of 2 mm
Clear work space	145 x 100 mm
Free arm diameter	42 mm
Weight of machine head	26.5 kg

Technical description

This free arm lockstitch hemming machine is equipped with a rotary hook with horizontal axis, mounted at the end of the free arm and driven from the lower shaft by a gearing with ratio of 2 to 1, the lower shaft being driven from the upper shaft by a drive belt with gear ratio of 1 to 1. The stitch length, steplessly adjustable from 0 to 6 mm, is controlled by a revolving knob situated on the vertical column of the machine arm. The machine is designed for forward stitching but can be equipped with a hand lever for reverse stitching (bartacking). The presser foot feed movement is derived from an eccentric mounted on the upper shaft. The drive is transmitted from the electric motor to the upper shaft by a V-belt. The right-side treadle controls the motor clutch, the left-side one, the presser foot lifting. The principal parts of mechanisms exposed to increased strain are seated in rolling contact bearings. The machine has a wick group lubrication and an automatic hook lubrication. Some lubrication places are oiled individually. For reasons of security, the machine is equipped with a V-belt guard and a thread take-up lever guard.
In its basic version, the machine is supplied without lighting, but is fitted with a screw and washer to receive a suspension-type lighting, available as Equipment No. 300.

Equipments and their Use

Commercial designation	Ordering No.	Name
317 E 043	S791 124033 35	Basic hemming set
317 E 046	S791 124046 35	Stitching set for stitching without hemming equipment
see table on page four		Hemming equipments
Z 066	S791 995066	Attachment cpl. for hand wheel
Z 074	S791 995074	Parts for backtacking
317 Z 109	S722 730109 40	High mortality spare parts kit in a plastics box
Z 012	S794 222012	Halogen lighting (12 V, 20 W - contains transformer)
Z 011	S794 222011	Suspension-type lighting

Table of hemming equipments

Type of material	Equipment No.	Ordering No.	Width border strip (mm)	Production No. of hemming equipments	Suitable for hemming
Upper leather	317 N 007	S791 705007	8	049 064	Leather upper with lining
	317 N 008	S791 705008	10	049 253	Textile shoes for winter season
	317 N 028	S791 705028	14	049 254	Slippers
	317 N 029	S791 705029	16	049 560	Leather upper, edge of leg portion
Textile with selvedge	317 N 009	S791 705009	8,5 - 9	049 276	Textile upper with linning, up to 1.8 mm thick material
	317 N 011	S791 705011	13	049 301	Slippers
	317 N 024	S791 705024	14	049 625	Slippers, up to 1.7 mm thick material
	317 N 012	S791 705012	16	049 278	Insole, up to 3.8 mm thick material
	317 N 013	S791 705013	20	049 302	Insole, up to 2.8 mm thick material
One-sided folded textile	317 N 014	S791 705014	8	049 306	Textile upper with lining, up to 1.7 mm thick material
	317 N 015	S791 705015	11	049 307	
Double-sided folded textile	317 N 017	S791 705017	21	049 437	Textile upper with lining
	317 N 018	S791 705018	23	049 308	Textile shoes winter season, with warm lining
	317 N 019	S791 705019	26	049 280	
Synthetic material	317 N 022	S791 705022	8	049 277	Leather and textile upper with lining
	317 N 026	S791 705026	8	049 626	For inserting binding made of "Chemlon" (a synthetic material)

I. INSTRUCTIONS FOR SERVICING OF MACHINE

A . General instructions

1. Read the instructions of the manual carefully and adhere to them.

2. During transport and while unpacking the machine, proceed in accordance with the instructions and marks on the packing.

3. Report any damage which has occured during transport to the railway authorities or to the forwarding agents at once. Immediately after unpacking, check the contents against the order and report any discrepancies to us. We cannot recognize claims submitted at a later date.

4. Having transported the machine to its work site, remove the preserving grease coating and all impurities from the machine head. make sure that no machine part has become loose and that its mechanism is free of any foreign body.

5. Lubricate the machine daily. Before lubrication, always check whether the lubrication places are clean. It is advisable to lubricate frequently in small quantities rather than conversely. With a hand oil can, drip oil into all the holes marked in red. Check the oil level on the oil level indicators on the machine arm.

6. Clean the machine daily, in particular the parts which become choked by impurities from the sewn material. During the cleaning, carefully check whether no machine part has become loose.

7. Once a week, during thorough cleaning, carefully check the whole machine to see that no parts are damaged and that all machine mechanisms operate correctly. Any faults ascertained must be repaired immediately. Once a year, general overhaul should be carried out. The machine should be dismantled, thoroughly cleaned, individual pieces as well as the parts of the electrical equipment inspected, faulty or worn out pieces repaired or exchanged.

8. Adhere to the safety regulations. Never clean the machine or repair defects until the machine is at rest. Do not remove covers or other safety devices.

9. The electrical equipment of the machine should be kept in a good and faultless state, in accordance with the electrotechnical and safety regulations. The lead - in cable, supplied as a part of the machine, has a corss sectio of 4 x 1 mm^2, and must be protected accordingly in each phase. If the machine is provided with a plug make sure always before plugging in that all switches are off. Never try to repair any defects of the electrical equipment by ourself but call in an expert electrician.

10. We cannot assume any responsibility for the consequences resulting from the non-observance of these instructions.

B. Packing, unpacking, cleaning and lubrication of machine

1. Packing of machine

The machine head is seated in a separate case, the stand either in crating or in another case (for severe climate conditions).

2. Unpacking of machine

When taking over the machine from the railway authorities or in the works ascertain whether it has arrived in good order. Report any damage which has occured during the transport to the railway authorities or to the forwarding agents immediately. The unpacking should be carried out carefully so as to prevent damage to machine parts.

Further check the accessories of the machine against the order and report any discrepancy immediately, as we cannot consider belated claims.

3. To set the machine on stand

When unpacking the machine out of the box and when putting it from one place to another, always hold it by its arm. Remove the protective grease coating and possible impurities and check whether it has no loose parts or foreign bodies on it or in its mechanism. After the machine has been brought to its work site, set it on the stand and fasten it with four screws to be inserted from the lower side of the stand plate. Check the treadles for correct function, i.e., the right-side one for actuating the clutch of the electric motor, the left-side one for lifting the presser foot, after connecting the tie rod of the left-side treadle with the lifting mechanism. Screw out the two screws, remove the belt guard, put the V-belt on the motor pulley, mount the belt guard and fix it it with the screws.

4. To set and fix the machine

The machine is designed as a stable unit with the stand, requiring no fixing to the floor. To make up for possible unevenness of the floor, use the levelling rubber piece situated on one of the stand legs and adjustable by means of turning a handwheel also mounted on the leg.

5. To clean and lubricate the machine (Figs. 1, 1a)

Before putting the unpacked machine into operation, remove the protective grease coating and clean the machine thoroughly. Suitable oil for the machine and the hook is the white heavy vaseline oil with viscosity 50 $mm^2.s^{-1}$ at 20°C. Since the machine has a group wick lubrication, drop into the tank of the oil level indicator more oil than is usual in the individual lubrication of machine parts. The lubrication holes are marked with red circles around them. Before lubrication, check if the lubrication holes are clean, and clean them in case of need. It is advisable to oil the machine several times a day. The hook is oiled automatically from the oil tank located in the machine arm. Check the oil level on the oil level indicator and refill oil in time. The hook and its mechanisms should be cleaned several times a day. Remove the fluff with a fine brush, apply some drops of kerosene to all soiled parts of the hook and its surrounding mechanism, let the machine run at high speed, then stop it, wipe off flushed-out dirt, and oil the hook with its mechanism. This cleaning should be carried out daily, in particular after the end of the work shift, in order to prevent dirt from drying on the hook and its mechanism. Before proceeding to clean the machine, unthread it and take the hook bobbin out of the hook. Once a week, clean the machine thoroughly from all impurities and from settled oil.

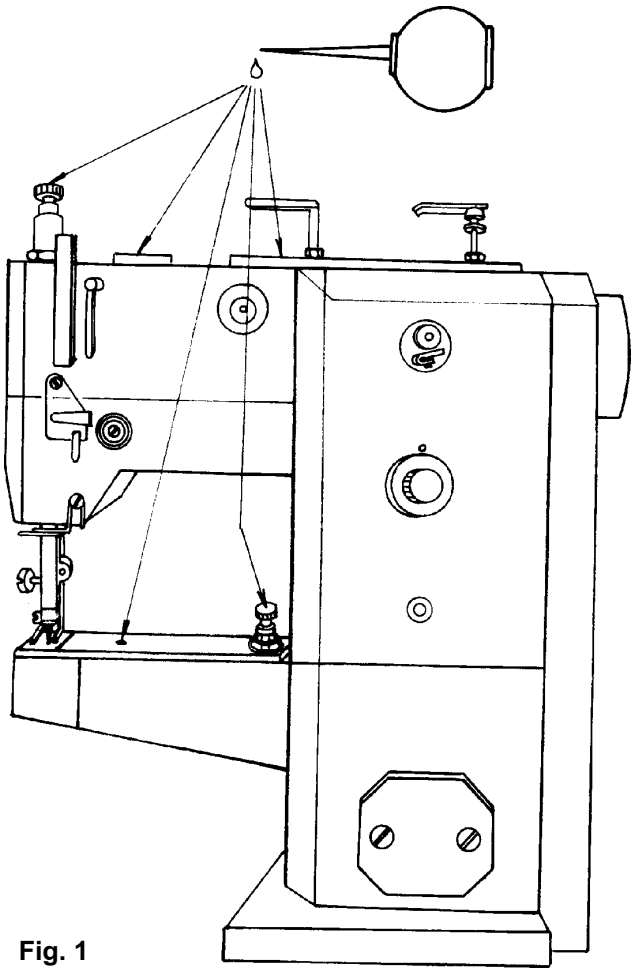


Fig. 1

Lubrication places:
The two principal lubrication places are located on the upper cover of the machine arm. One of them is used to refill oil in the oil tank twice a week, to one half of the oil level indicator situated on the front part of the macarm. The other lubrication places are shown in the lubrication chart.

Warning !
Before proceeding to clean and lubricate the machine, be sure to switch off the main switch and hold your feet away from the machine stand treadles in order to avoid accidental machine start by treadle actuation.

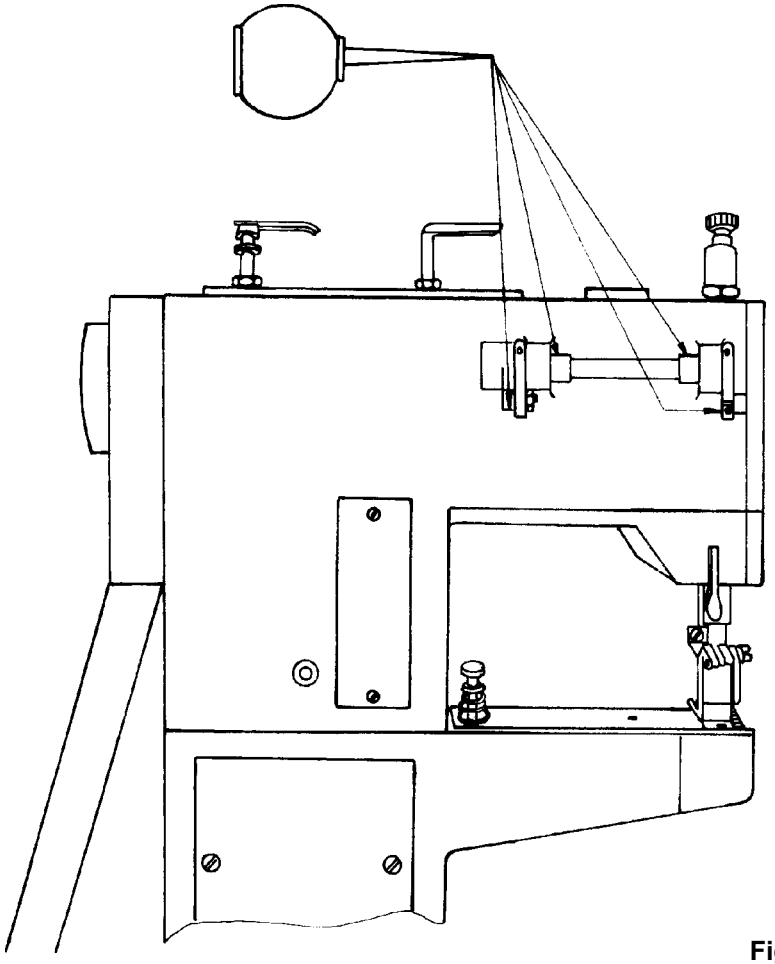


Fig. 1a

6. Amount of oil supplied for hook lubrication

The oil coming by means of a wick prevents the hook hrom getting seized. After the machine has been put into service, check at regular intervals the oil level in the oil tank disposed on the machine arm.
T o o b s e r v e :
At the resumption of work after a relatively long interval, e.g., at the beginning of the morning shift, it is advisable first to remove the gathered supefluous oil from the hook, either by letting the machine run idly for a short period or by producing a few stitches, about 20 cm, on a test material, to prevent the sewn work from getting soiled by oil.

7. Instalation and gearing lighting with transformer

Gearing of lighting may be performed by a specialist - electrician with the machine unplugged from mains !
The lamp is assembled on the front part of arm by using the peg. The conductor is passed through a hole in the stand and after unscrewing the cover of the transformer it is plugged to 24 V screws and ensured with fastener. The cover of the transformer is screwed and the transformer is fastened with added screws o 4 x 25 into pre-drilled holes in the bottom side of the machine stand. We must make a hole in the motor clamp from the bottom side and screw the outlet P 16. The conductor is fastened under the installed fasteners and screwed to the transformer after passing through the outlet P16 and then it is screwed to the 2 bottom screws of the clamp. The cover of the clamp is screwed again. By using the added fasteners the conductor is fastened to the arm of the machine and the lamp is adjusted to the suitable position.

Warning !
Avoid any intervention into the electrical equipment of the machine but call in an electrician. Unqualified intervention ivolves the risk of accident by electric shock.

8. Hand reverse sewing lever instalation (Fig. 2)

It is possible to assembly the lever for hand controlled bartacking. We unscrew the screws /1/ and put off the cover of the belt. Then we slack the screw of the cradle /4/ through the hole in the arm. We shift the reverse sewing shaft towards the worker. By shifting hand lever /2/ we must be careful not to deform the cradle bar /3/. We can check the assembly by eye after unscrewing the rear cover /5/. We define the axial will of the lever and cradle, we adjust the lever to the same position as the machine and tight up the screw /4/. We test the sewing and screw up the cover of the belt. By pressing of the lever down, the sewing direction will be changed. After release the lever returns to previous position and the machine will sew in front direction.

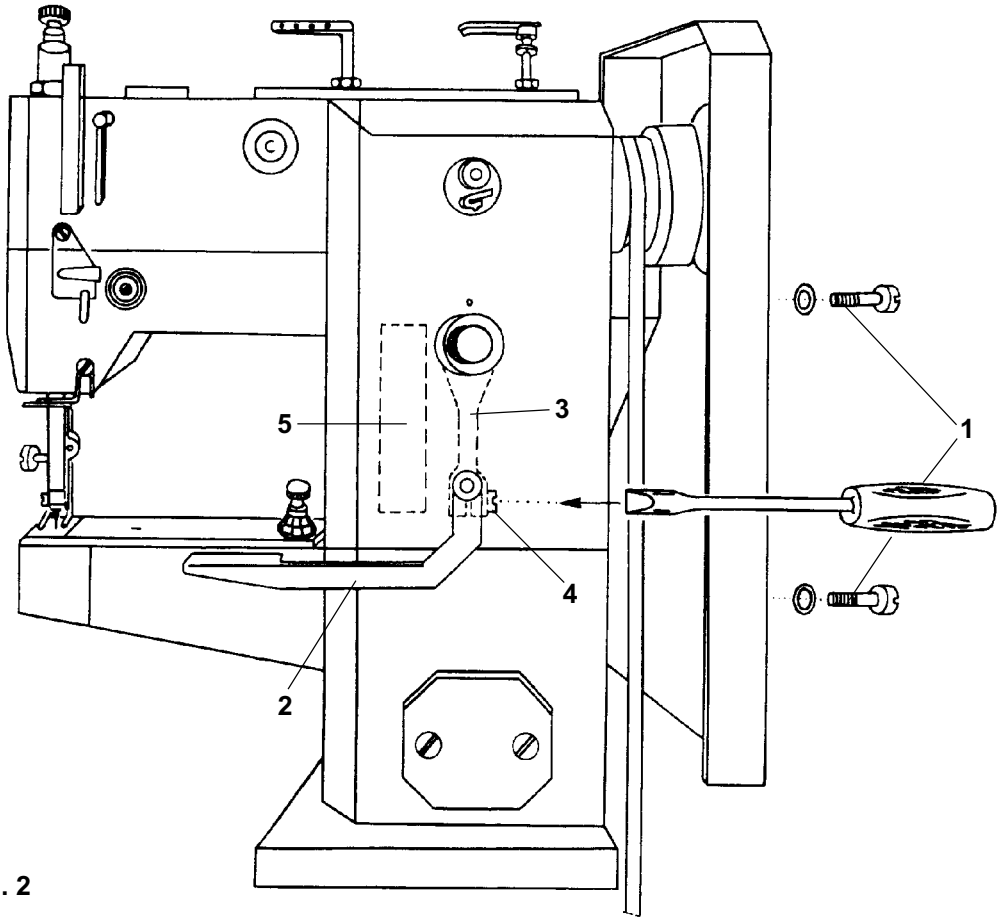


Fig. 2

C. To prepare the machine for sewing

1. General inspection

Inspect the machine thoroughly for loose parts as well as for the presence of foreign bodies. With the electric motor switched off, depress the right-side treadle and rotate the handwheel by hand to see whether it revolves freely and whether the machine is adjusted correctly. Further check for correct function:

- the presser foot lifting with the left hand and with the left-side treadle
- reverse stitching by means of the hand lever on the vertical column of the machine arm

2. Sense of rotaion

The correct sense of rotation of the machine handwheel is anticlockwise, viewing the machine from the side of the handwheel.

3. Electrical equipment

An electrician connects the machine to the mains 3 x 380 V, 50 Hz. Switch on the electric motor and check whether the pulley turns in the correct direction shown by the arrow on the cover of the electric motor, i.e., to the left, toward the operator. If this is not the case, the plug of the lead-in cable must be taken out and the cable must be switched over on the plug or on the terminal board of the electric motor. The incorrect sense of rotation of the pulley is inadmissible.

Warning !
Avoid any intervention into the electrical equipment of the machine but call in an electrician. Unqualified intervention ivolves the risk of accident by electric shock.

4. V-belt and its tension (Fig. 3)

The V-belt tension can be adjusted by displacing the electric motor in the groove of its holder after loos-ening the four clamping screws.
The correct belt tension ensures transmission of full power with losses reduced to minimum. To check the tension of the V-belt, depress it lightly in the middle part between the handwheel and the motor pulley; if the belt tension is correct, the pressed-on part will yield some 20 mm sideways. Excessive tension of the V-belt reduces machine output and increases both the power consumption and the wear of the bearings. Set the machine to its opera-tive position, check the V-belt for correct tension, and mount the belt guard.
Before proceeding to any adjustment on the ma-chine, be sure that it is switched off.

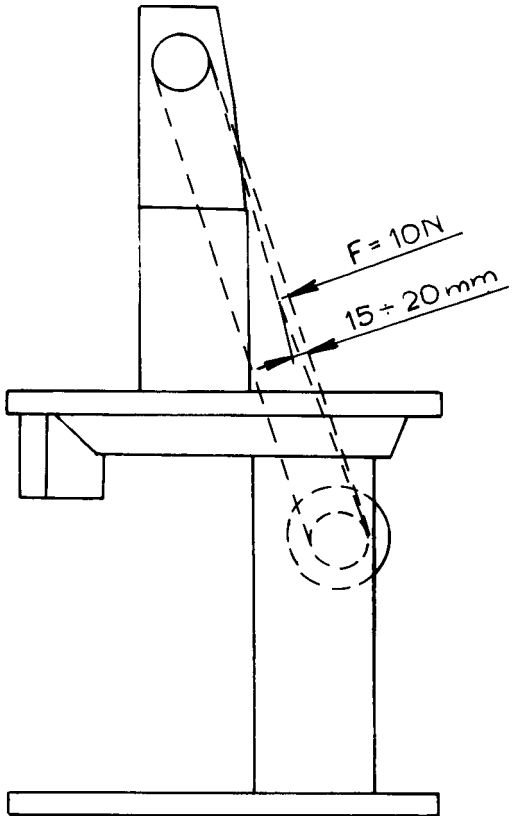


Fig. 3

5. To lift the presser foot

The lifting and sinking of the presser foot is actuated by the left-side treadle. To lift the presser foot and to lock it in the lifted position, the hand lifting lever placed at the rear side of the machine arm can alsobe used. To sink the presser foot onto the sewn work, first slightly depress the left-side treadle so as to disengage the locking of the lifted presser foot.

6. Needles and threads

The machine requires the use of needles 134, Schmetz 797 CFCF current sizes, hard chromium plated. Considering the high machine performance and the resulting needle heating, it is advised to use hard chromium plated needles. The size of the needle to be used depends on the size of the thread, since it must pass freely through the needle eye. It is advisable to choose a needle sufficiently big to permit free thread passage through the needle eye. Only high-class threads should be used, an S-twist one for a the needle, and an Z-twist one for the hook bobbin. A coarse thread or one which has to overcome considerable resistance when passing through the needle eye reduces the machine performance and increases its trouble incidence. With synthetic threads, it is necessary adequately to reduce the sewing speed and to use only hard chromium plated needles to improve heat dissipation from the area of the needle eye so as to avoid the risk of melting and breaking the synthetic thread.

7. To insert the needle (Fig. 4)

Switch off the motor, depress the right-side treadle, and rotate the handwheel towards you until the the bar reaches its top position, i.e., until the greatest possible distance between the needle holder and the throat plate has been obtained. Sink the presser foot on the sewn work, loosen the screw /1/ of the needle bar and insert the needle up to the stop, with its long groove to the left of the operator. (The correct insertion of the needle up to the stop can be visually checked in the transverse hole of the needle bar). Fix the correctly inserted needle by retightening the screw. Each time you inserted a new needle, check first whether it is straight in order to ensure that it will pass through the centre of the needle aperture provided in the feed-dog. Never use a needle chosen haphazardly but choose it with respect to the character of sewn work and to the thread size.

Warning !
Before proceeding to exchange the needle, be sure to switch off the main switch and hold your feet away from the machine stand treadles in order to avoid accidental machine start by treadle actuation.

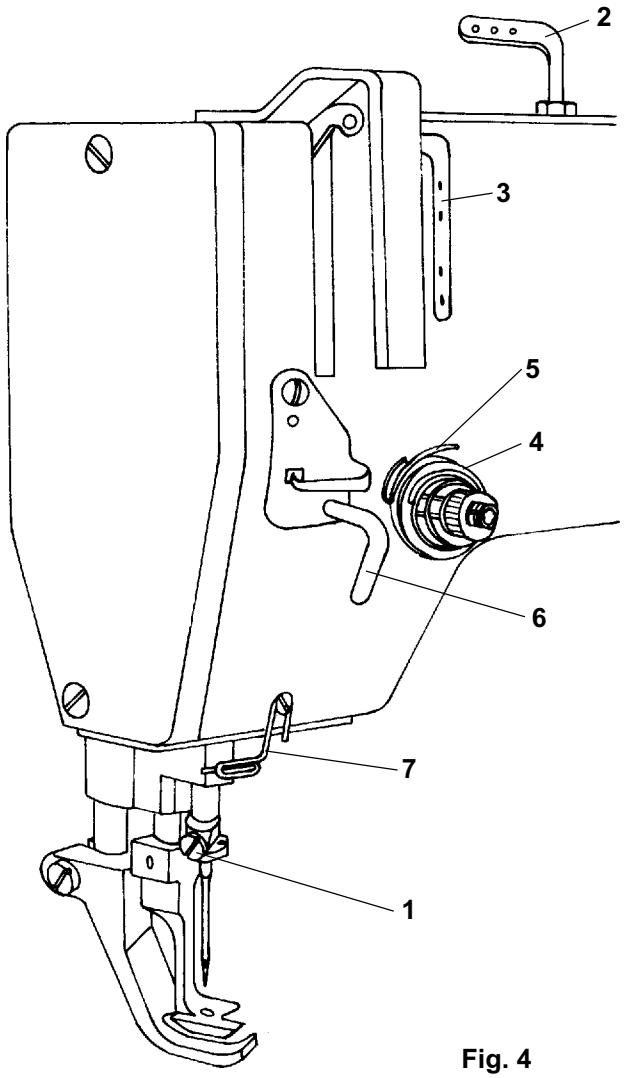


Fig. 4

8. To thread the upper thread (Fig. 4)

Put the bobbin on the bobbin stand, unwind a sufficient portion of it, and pass it through the thread guide of the bobbin stand, then through the thread guides /2/, the adjusting spring, the thread guide /5/, into the eye of the thread take-up lever, downwards through the thread guide /6/, through the aperture of the needle bar and, from the left to the right, into the needle eye.

Warning !
Before proceeding to thread the machine, be sure to switch off the main switch and hold your feet away from the machine stand treadles in order to avoid accidental machine start by treadle actuation.

9. To take out the hook bobbin

Set the needle bar to its top position, push away the hook cover, open the bobbin case lock, and take the bobbin case out. As long as the bobbin case lock is open, the bobbin is held in the case. Release the lock, turn the bobbin case upside down, i.e., with its open side downwards, and the bobbin will fall out.

Warning !
Before proceeding to exchange the bobbin of the hook, be sure to switch off the main switch and hold your feet away from the machine stand treadles in order to avoid accidental machine start by treadle actuation.

10. To wind the hook bobbin (Fig. 5)

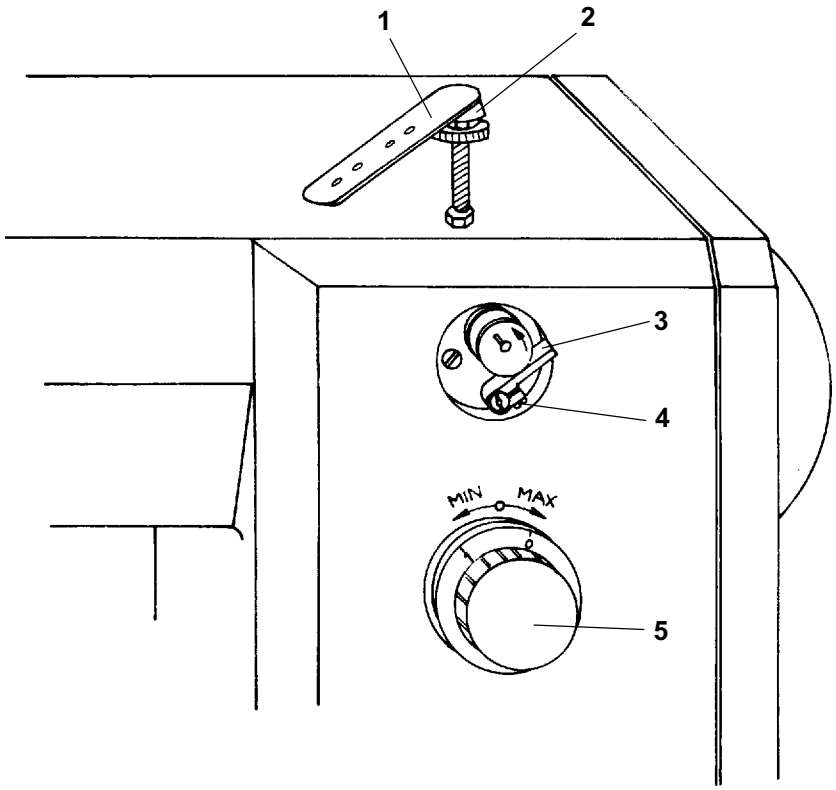


Fig. 5

To wind the hook bobbin, a bobbin winder, adapted to be mounted on the front side of the machine arm, is available on special order as Equipment No. 201. Lead the thread from the bobbin stand through the aperture provided in the bobbin stand arm, through the aperture of the thread guide /1/ between the braking discs /2/ then through the other apertures of the thread guide /1/ to the bobbin mounted on the winder shaft, and push the winder shaft. The winder is now operable and as soon as the machine is started, begins automatically the bobbin winding which the thread is evenly distributed along the whole of the bobbin width. As soon as the bobbin is fully wound, the stop-start lever springs off and the winder shaft automatically gets out of engagement, thus finishing the winding.

11. To thread the lower (Fig. 6)

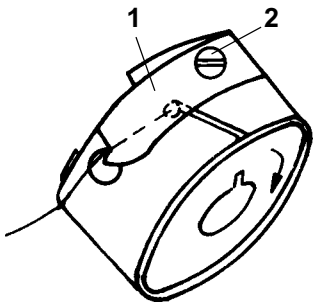


Fig. 6

Put the fully wound bobbin into the bobbin case and insert the thread end into the notch of the bobbin case, then pass the thread end under the pressure spring /1/ of this bobbin case with the bobbin and with released lock.

12. To catch the lower thread

With your left hand, grasp lightly the upper thread end without stretching it. With your right hand, turn the handwheel towards you until the threaded needle reaches subsequently its bottom and top positions, thereby catching the lower thread. Draw then lightly the upper thread until the lower thread shows through the aperture of the feed-dog, and lay the two thread ends behind the needle. When threaded, the machine may be started only after a bit of material has been inserted under the presser foot. Both when starting and when finishing the sewing, the thread take-up lever should be placed in its top position to avoid the risk that the upper thread will thread out and possibly catch in the hook course.

13. Sewing - the work proper

Insert the material to be sewn under the presser foot and fix it by sinking the presser foot, then switch on the electric motor and depress gradually the right side treadle. In this way, the machine is set in motion and the sewing speed increases up to the maximum obtained when the treadle has reached its lowest position. By releasing the treadle, the clutch of the motor is disengaged, the electric motor braked, and the machine stopped. During the sewing, avoid pulling the amterial but guide it only. By pulling the material you bend the needle with the risk of breaking it in case of collisions with the edge of the needle aperture of the feed-dog. Repeated collisions of this kind make the needle aperture burr which, in its turn, causes thread ruptures. At the end of the sewing operation, set the thread take-up lever to its top position, raise the presser foot, and take the sewn work from under it. When observing the described sequence of actions, the machine is ready for next stitching.

T o o b s e r v e :

Having put the new machine in use, do not charge it fully from the very beginning. During the first two or four weeks, when the machine is running-in, increase its speed gradually from about 2,500 stitches per min. and check carefully its running. Throughout this time, pay special attention to the machine lubrication. By keeping to these rules you will obtain a long service life and perfect precision of the machine even at its full performance.

II. INSTRUCTIONS FOR ADJUSTMENT OF MACHINE MECHANISMS

This section describes adjustments of the type that can be carried out on the work site. Larger adjustments, requiring more time, should be carried out by a skilled sewing machine mechanician.

1. Stitch length adjustment (Fig. 5)

The stitch length can be steplessly adjusted from 0 to 6 mm by turning the knob /4/ provided on the vertical part of the machine arm. By turning it to the right, you increase the stitch length, by turning it to the left, you reduce it. For easier handling, the reverse stitching hand lever should be slightly pressed downwards during the stitch length adjustment.

2. Reverse stitching

The reverse stitching is obtained by depressing the hand lever downwards. When released, the lever automatically resumes its previous position and thus restores the forward stitching.

3. Thread tension adjustment (Fig. 7, 7a)

The tension of the upper and the lower thread must be so interrelated that the stitch binding takes place in the median layer of the sewn material. To increase the upper thread tension, turn the nut /1/ to the right (clockwise), to reduce the tension, turn it to the left. To adjust the lower thread tension /4 Fig 7a/, use the screw provided in the middle part of the pressure spring of the bobbin case. By turning the screw /5/ to the right /to the left, you in crease/ reduce the pressure of the spring on the bobbin case between which and the spring the thread passes and, consequently, the lower thread tension. If the lower thread tension has been adjusted correctly, the adjustment of the upper thread tension will be sufficient, as a rule, to restore the desired quality of stitching.

4. To adjust the presser bar pressure (Fig. 7)

The pressure exerted by the presser foot is actuated by the adjusting screw /2/ accessibly located on the upper part of the machine arm. By turning it to the right/to the left, you increase/reduce the pressure. The pressure of the presser foot must be sufficient to provide for reliable and continuous feeding even at the top sewing speed. On the correct adjustment of the presser bar depends the uniformity of feeding of the sewn material as well as that of the stitch length. Excessive presser foot pressure results in excessive wear of the whole mechanism and in corresponding reduction in the service life of the machine.

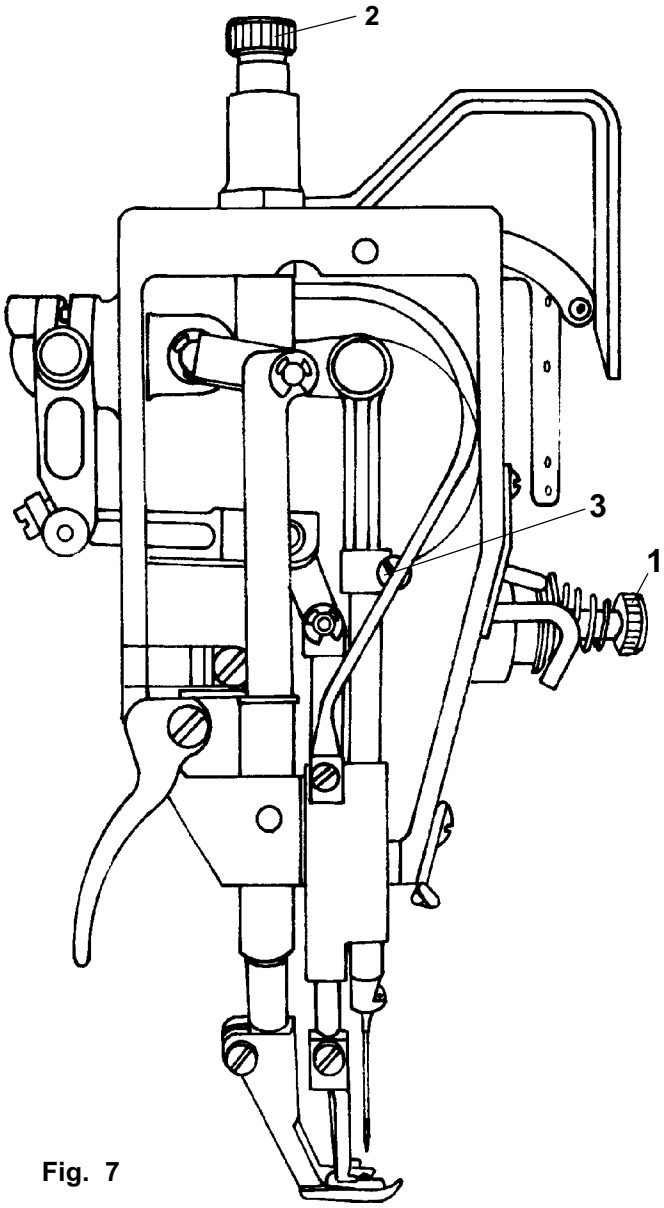


Fig. 7

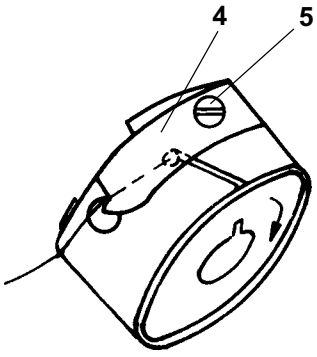


Fig. 7a

5. To adjust vertical stroke of the presser feet (Fig. 8)

The vertical stroke of the presser feet is adjustable so as to meet the feed requirements imposed by various sewn work thickness, and the vertical stroke of the small feed foot is always greater than that of the big presser foot, depending on the sewn work thickness and on the width of the tape. To adjust the stroke, loosen the screw /1/ on the lever of the drive shaft and dispalce the lever either toward the operator, to reduce the stroke of the small presser foot, or away from the operator, to increase it. The stroke of the big presser foot, holding the sewn pushed to the throat plate, is inversely proportional to that of the small foot, i.e., the greater is the stroke of the small presser foot, the smaller of the big one. The total stroke range of the presser feet can be adjusted by displacing the pin of the connecting rod /3/ in the groove of the lever /2/. The lower is the position of the pin with respect to the pivot axis, the smaller is the total stroke range of the presser feet, and vice versa.

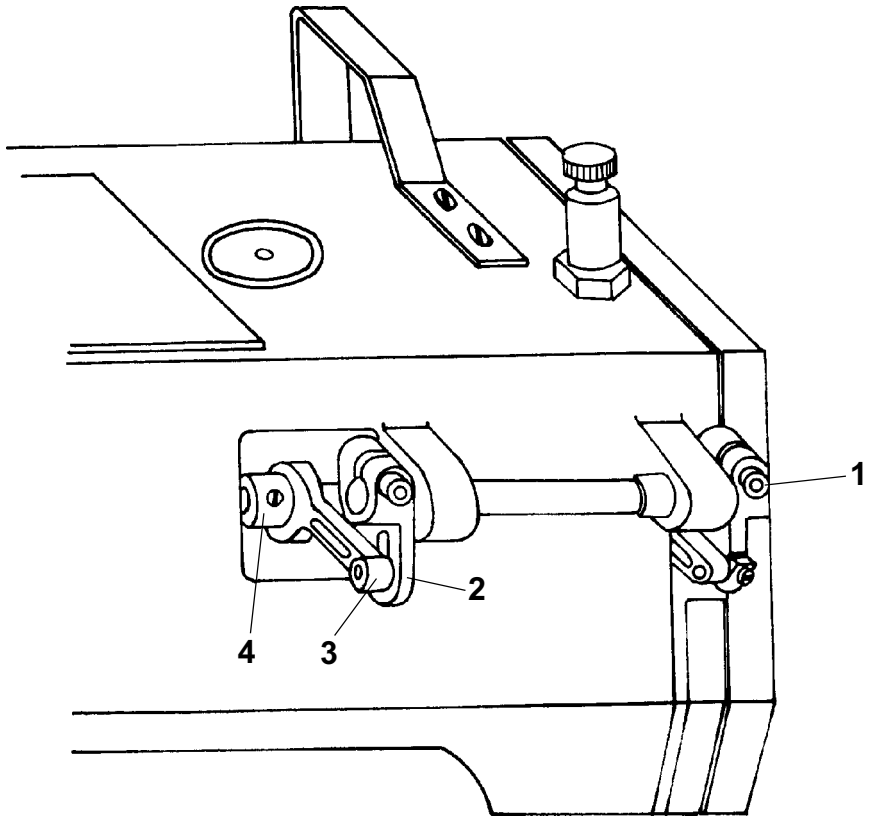


Fig. 8

6. Feed-dog (Fig. 9a)

The feed-dog must be properly seated and so fixed with the screws /1/ as to ensure that the needle passes through the centre of its needle aperture which must not be burred, damaged by thread or needle, or otherwise damaged, since any damage of this kind would unfavourably affect the quality of stitching.

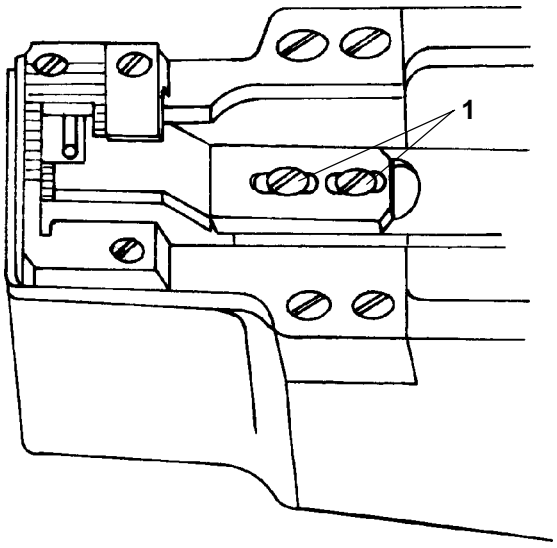


Fig. 9a

7. To adjust the feed-dog height above the throat plate (Fig. 9b)

The height of the feed-dog teeth above the throat plate should be adjusted between 0.2 and 0.3 mm. For adjustment, first loosen the screw /1/ of the feed-dog support on the lower arm, then tighten the screw properly with a screwdriver.

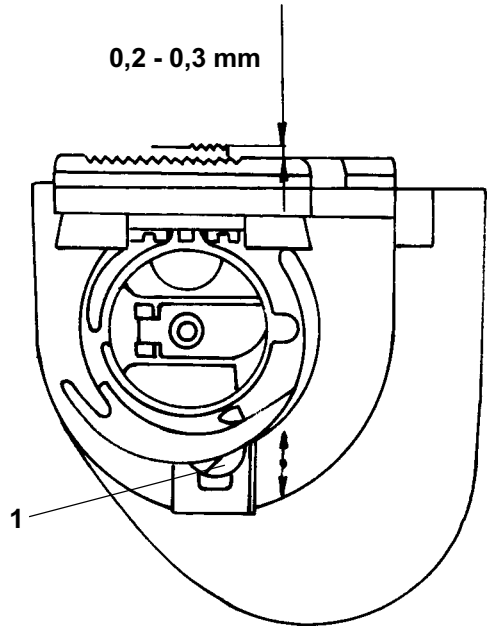


Fig. 9b

8. To adjust the movement of the needle and the feed foot

Adjust the eccentric /4/ mounted on the upper shaft, see Fig. 8.

9. To adjust the needle bar height (Figs. 7 and 10)

The hook must be so interrelated with the needle that at the moment when the hook point begins to take up the upper thread loop, the upper edge of the needle eye comes to lie about 1.5 mm under the hook point. If the needle bar height is not adequate to this requirement, loosen the respective screws, remove the front plate, loosen the scre of the needle bar carrier /3, Fig. 7/, adjust the needle bar height correctly, retighten the screw properly, and mount the front plate.

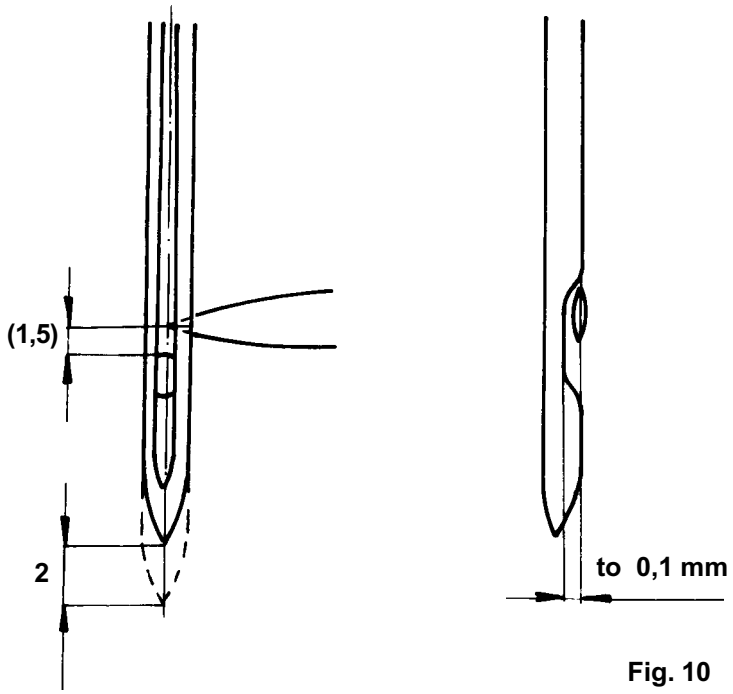


Fig. 10

10. To adjust the hook course (Fig. 10)

Set the stitch length at zero and turn the handwheel towards you until the needle bar reaches its bottom position and reascends by 2 mm. In this position, the hook point must be aligned with the needle axis, the distance between the hook point and the needle being 0.1 mm or less. If this is not the case, loosen the hook and set its position correctly, then retighten the screws and check the gap as well as the hook course.

11. To adjust the hook holder

Set it so as to obtain a gap of about 0.7 to 0.9 mm between the holder lug and the bottom of the groove of the hook inner part. For this adjustment which is to be carried out only after the hook course adjustment, loosen the hook holder screws.

12. To remove and to mount the drive belt (Fig. 11)

Screw out the screws /1/, remove the upper belt guard /2/, take the V-belt from the handwheel groove, loosen the two screws, and take the handwheel together with the bearing /3/ from the machine arm and from the upper shaft. Pass the drive belt /4/ through the aperture thus created in the machine arm, along the upper shaft, and put it on the two belt wheels. Set the handwheel with its bearing back on the upper shaft in such an angular position that the first screw in the sense of rotation of the handwheel, when tightened, comes to about on the small flat surface provided on the upper sahft, then secure the handwheel with screws, mount the V-belt on the handwheel, mount the upper belt guard and fix it with screws.

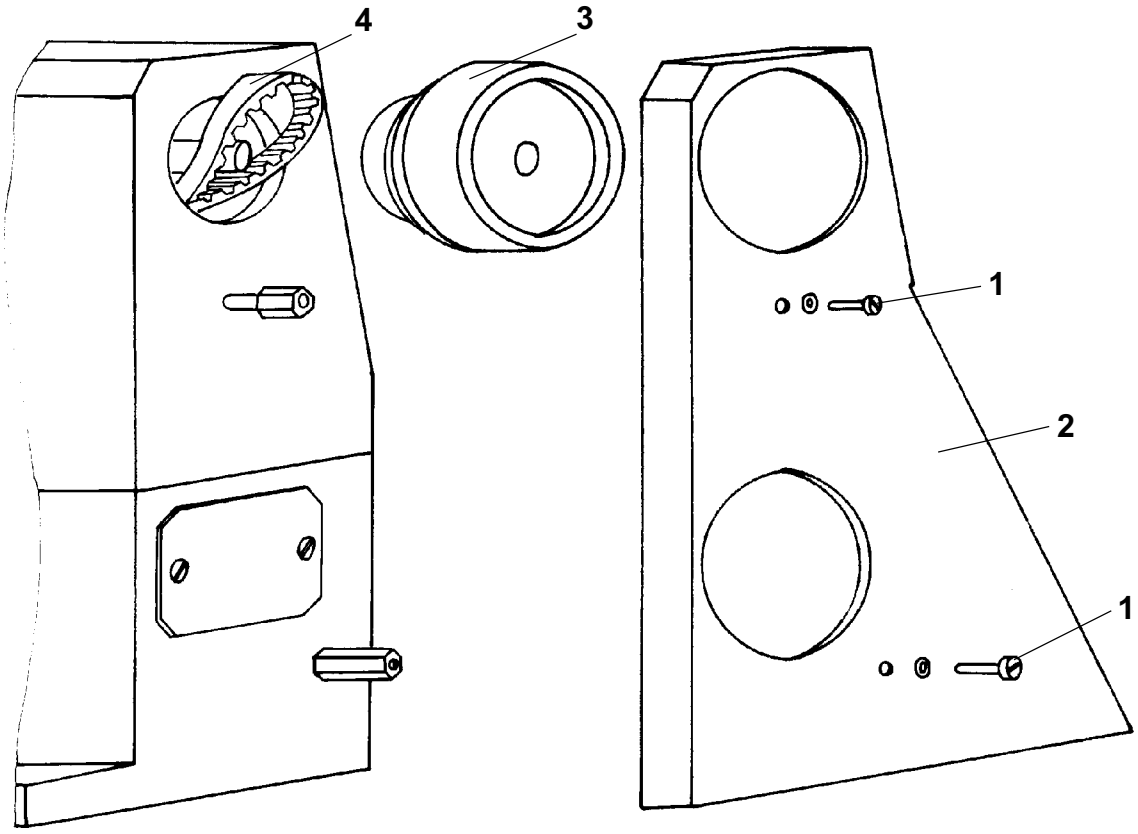


Fig. 11

To observe:
After each mounting or exchange of the drive belt, always adjust the hook course, as described in the preceding paragraphs of these Instructions.

13. To exchange the presser foot

First raise the needle and, by means of the hand lever, the presser bar, to their top positions, then loosen the presser foot fixing screw and remove the presser foot. To insert the presser fooot, proceed in the same way. When the new presser foot is mounted check, in its lifted position, if the needle bar during its reciprocating movement does not collide with the presser foot.

14. To adjust the feed step length

Set the stitch length adjustment knob to its zero position, loosen the screw of the sleeve of the oblique cylinder, and set the ball bearing with the oblique cylinder in the sleeve so as to obtain zero eccentricity of the eccentric (visually, the connecting rod remains). Tighten the sleeve screw and check whether the feed step length is the same for forward and for reverse stitching. If not, readjust it in the above described manner.

15. To adjust the function of the adjusting spring (Fig. 12)

To adjust the tension of the adjusting spring /1/, loosen the screw /2/ of the thread tensioner bushing /3/ and turn with screwdriver the pin /4/ of the thread tensioner either to the right, to increase the tension, or to the left, to reduce it, then retighten the screw /2/. To set the stroke of theadjusting spring, loosen the screw of the bushing and turn the bushing either to the left, to reduce the stroke, or to the right, to increase it. Retighten the screw and check the adjusting spring for correct function by producing on a test material a few stitches. Check also whether the thread, as it passes around the hook bottom, produces only a slight movement of the adjusting spring and is not tightened.

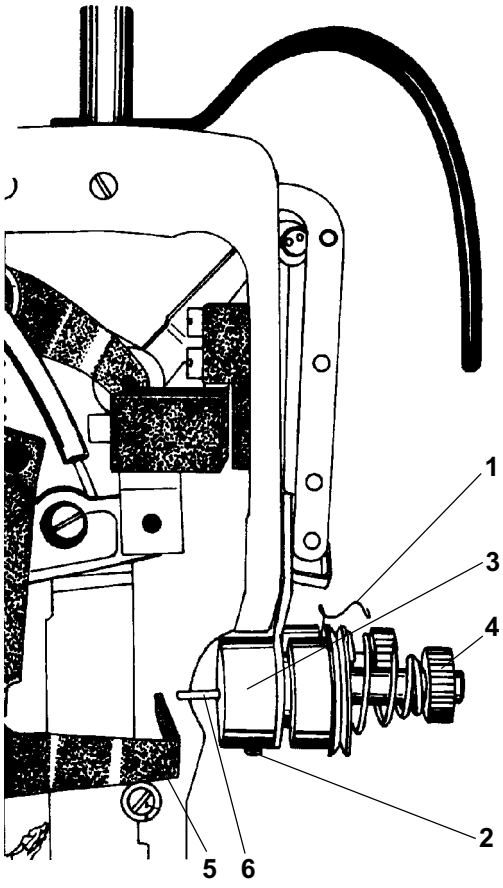


Fig. 12

16. Electrical equipment of machine

The machine is driven by asynchronous motor with squirrel cage mounted on the stand. To reverse the sense of rotation, change-over the lead-in cable either at the plug or at the terminal board of the motor.
T o o b s e r v e:
Any failure of the electrical equipment should be repaired by a skilled electrician.

Warning !
Avoid any intervention into the electrical equipment of the machine but call in an electrician. Unqualified intervention involves the risk of accident by electric shock.

17. To adjust the opening of the upper thread tensioner (Fig. 12)

The opening of the upper thread tensioner is actuated by means of a lever /5/ cooperating with a pin /6/ acting on a splice plate releasing an extension spring. If the opening fails to function, the whole thread tensioner is to be pushed some way into the machine, after the loosening of the screw /2/ in the machine arm. The gap between the thread tensioner discs, when opened, must provide for unobstructed thread passage.

18. Assembly and adjustment of the folder (Fig. 12a)

After fixing the folder on the plate by using the two screws bass and nuts it is possible to shift the folder to adjust required distance from the edge of bind. The distance is smaller by shifting to the left and bigger by shifting to the right.
By turning aside the folder it is possible to fine adjust the distance between the needle and the folder in order to create enough space for sewn material.
This adjustment influences accurate leading of the bind to sewn materials.
Binding is the sewin operation which quality depends not only on folder production and sewn material but also on skilfulness of worker.
That's why we recommend to submit sewing samples and consultation with Minerva workers before the agreement signature.

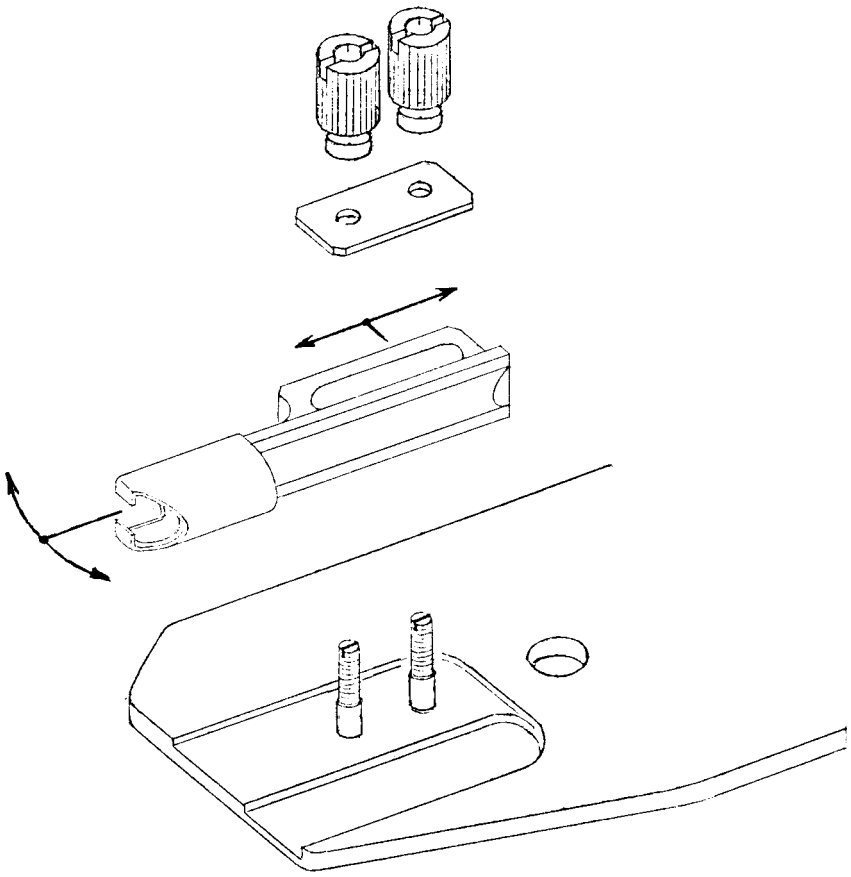


Fig. 12a

III. MAINTENANCE

1. Machine cleaning

Plain machine lines help to keep clean outer machine parts. From time to time, it is necessary to remove waste between the feed-dog and the throat plate. Otherwise, the machine should be cleaned daily.

Warning !
Before proceeding to clean and lubricate the machine, be sure to switch off the main switch and hold your feet away from the machine stand treadles in order to avoid accidental machine start by treadle actuation.

2. General overhaul and repair of machine

It should be carried out once a year. The machine should be set out of operation, cleaned, dismantled, faulty pieces eschanged and due repairs carried out. The machine should be then assembled and tested. The electric motor and the electrical equipment of the machine should be inspected and tested. The general overhaul and repair of the machine should be carried out so thoroughly as to enable the machine to run without major defects for the next year.

3. To store the machine

After the machine has been set out of operation, it should be thoroughly cleaned, inspected, and faulty pieces exchanged, if any. The machine should be then tested, coated with portective grease, and stored with all the tools and accessories.

V. FAULTS AND HOW TO REMOVE THEM

Fault	Cause	Remedy
a) Heavy machine run.	The machine has been out of use for considerable time; dried oil and impurities deposited in the bearings.	Inject some drops of kerosene into all lubrication holes and on the sliding surfaces and let the machine run rapidly so as to clean the lubrication holes in the bearings. Then oil the machine carefully with sewing machine oil.
b) Slow machine start.	Insufficient belt tension.	Increase the tension by displacing the electric motor.
c) Upper thread breakage.	1. Slashed thread guides.	1. Ascertain and exchange them.
	2. Too sharp hook point.	2. Reapir it.
	3. Faulty upper thread guiding or faulty needle threading.	3. Thread the upper thread correct (see par. 8, page 10).
	4. Incorrect upper thread tension.	4. Adjust it (see par. 3, page 13).
	5. Bad needle quality or bent needle.	5. Exchange the needle (see par. 7, page 10).
	6. The thread size is inadequate to the thickness of sewn material.	6. Use adequate thread.
	7. Machine considerably soiled.	7. Unscrew the throat plate, clean the mechanism, and set the throat plate.
	8. Thread rests wound on the hook.	8. Remove the thread rests.
	9. The thread is too thin or not strong enough.	9. Use adequate thread.
	10. Damaged needle aperture of the feed-dog.	10. Amend or exchange the feed-dog.
d) Lower thread breakage.	1. The thread is incorrectly threaded into the bobbin case.	1. Thread it correctly (see par. 11, page 12).
	2. The thread is too thin or not strong enough.	2. Use adequate thread.
	3. The thread is wound incorrectly on the bobbin.	3. Wind it on the bobbin correctly.

Fault	Cause	Remedy
	4. Damaged bobbin.	4. Exchange it.
	5. Too sharp pressure spring on the bobbin case.	5. Exchange the spring.
e) Skipped stitches.	1. Needle inserted incorrectly.	1. Insert it correctly (see par. 7, page 10).
	2. Blunt or bent needle.	2. Exchange it (see par. 7, page 10).
	3. Slashed or broken hook point.	3. Exchange the hook.
	4. Excessive needle aperture in the feed-dog.	4. Exchange the feed-dog (see par.6, page 15).
	5. Broken adjusting spring for up per thread tension.	5. Exchange the spring and adjust the upper thread tension (see par. 15, page 18).
	6. Needle bar positioned too high or too low.	6. Adjust it (see par. 9, page 16).
	7. Overturned hook, incorrect hook course.	7. Adjust the hook course (see par. 10, page 16).
	8. Soiled hook mechanism.	8. Clean it with kerosene.
f) Needle breakage.	1. Feed-dog positioned too low.	1. Adjust it in height (see par. 7, page 15).
	2. Faulty attendance - pulling the material.	2. Let the material pass freely.
	3. Needle too thin with respect to sewn work.	3. Exchange the needle (see par. 7, page 10).
	4. Needle inserted incorrectly.	4. Insert it correclty (see par. 7, page 10).
	5. Loosened feed-dog.	5. Check and fix it.
	6. Excessive upper thread tension.	6. Adjust it (see par. 3, page 13).

Fault	Cause	Remedy
g) Heavy and irregular feeding.	1. Feed-dog positioned too low.	1. Adjust it in height (see par. 7, page 15).
	2. Worn-out feed-dog.	2. Exchange it.
	3. Insufficient presser foot pressure.	3. Increase the pressure (see par. 4, page 13).
h) Stitch forming below sewn material.	1. Tensioner discs damaged by upper thread.	1. Exchange them and adjust the upper thread tension (see par. 3, page 13).
	2. The thread does not pass smoothly around the hook or catches the bobbin case.	2. Clean the hook and adjust the bobbin case.
	3. The upper thread is not threaded between the tensioner discs.	3. Thread it correctly (see par. 8, page 10).
	4. Thread broken and caught between the tensioner discs.	4. Clean the thread tensioner and adjust it (see par. 3, page 15).
	5. Incorrect proportion between the tensions of upper and lower threads.	5. Correct the proportion and check it from time to time (see par. 3, page 13).
i) Stitch forming above sewn material.	1. Damaged spring on the bobbin case, the lower thread is braked insufficiently.	1. Exchange the spring.
	2. The lower thread is not threaded under the spring of the bobbin case.	2. Thread it correctly.
	3. Broken thread caught under the spring of the bobbin case.	3. Remove the thread.
	4. Incorrect proportion between the tensions of upper and lower threads.	4. Correct the proportion (see par. 3, page 13).

Fault	Cause	Remedy
j) Locked hook.	Thread rests caught in the hook.	Rotate the handwheel in both directions regardless of the considerable resistance until the caught thread rests are cut to pieces. Remove them and start the unthreaded machine. Let it run for a period, then drip two or three drops of sewing machine oil on the hook, and finally check the position of the overload release clutch.
k) Bad function of hemming equipment.		Correct it (see par. 18, page 19).

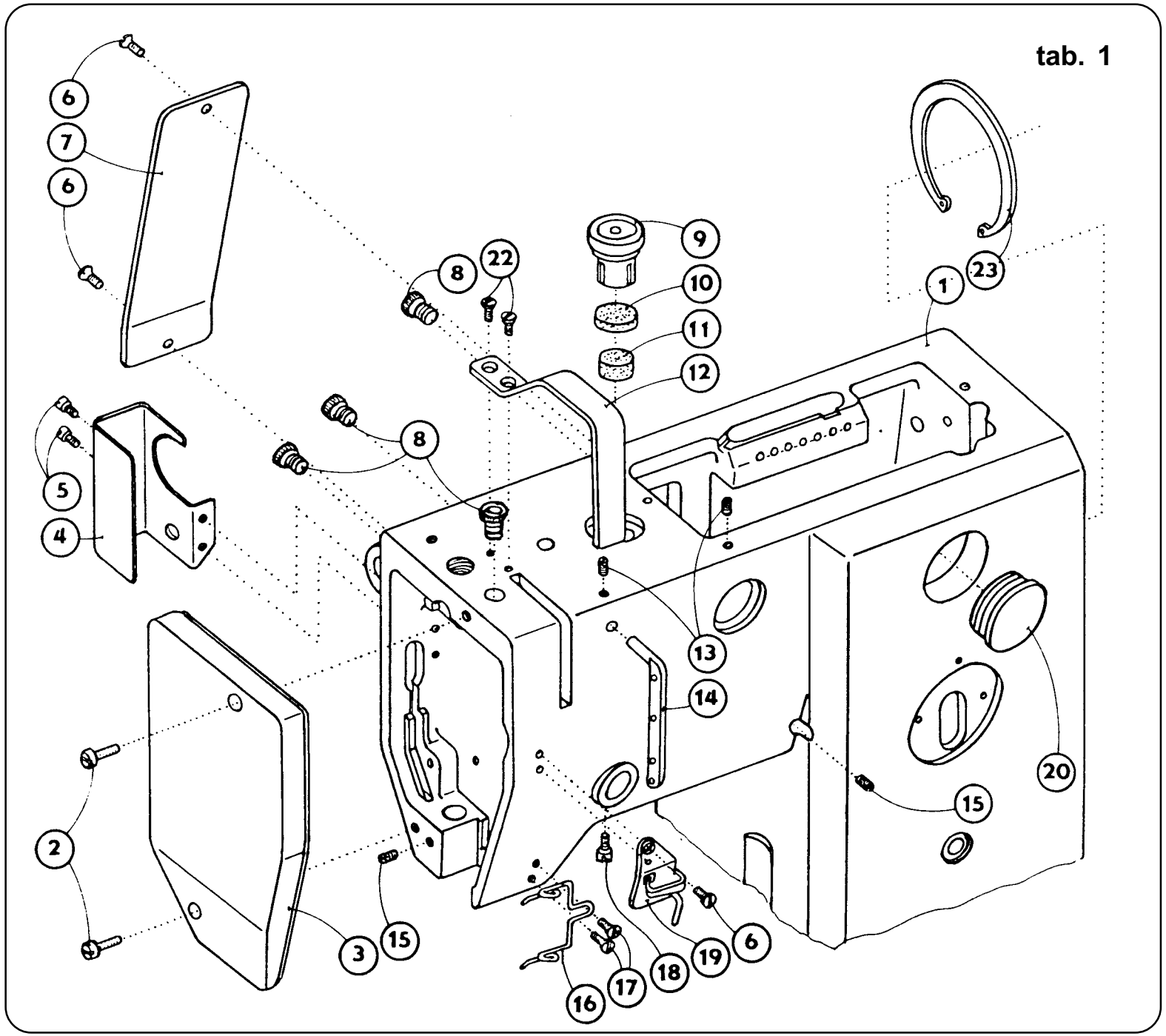
V. HOW TO USE THIS CATALOGUE AND ORDER SPARE PARTS

For effective of the Catalogue, carefully study the following information:
The Catalogue is divided into two sections:

1. Instructions for servicing with figures and technical data
2. Tables of spare parts with spare part list

Please, specify in each order for spare parts:

a) machine type and its production No.
b) the twelve-digit No. of the part
c) number of parts



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5	S080	120409
6	S080	123117
7	S080	831442
8	S321	001000
9	S321	003000
10	S080	945100
11	S080	945188
12	S080	831456
13	S080	111251
14	S080	272039
15	S080	111247
16	S080	271462
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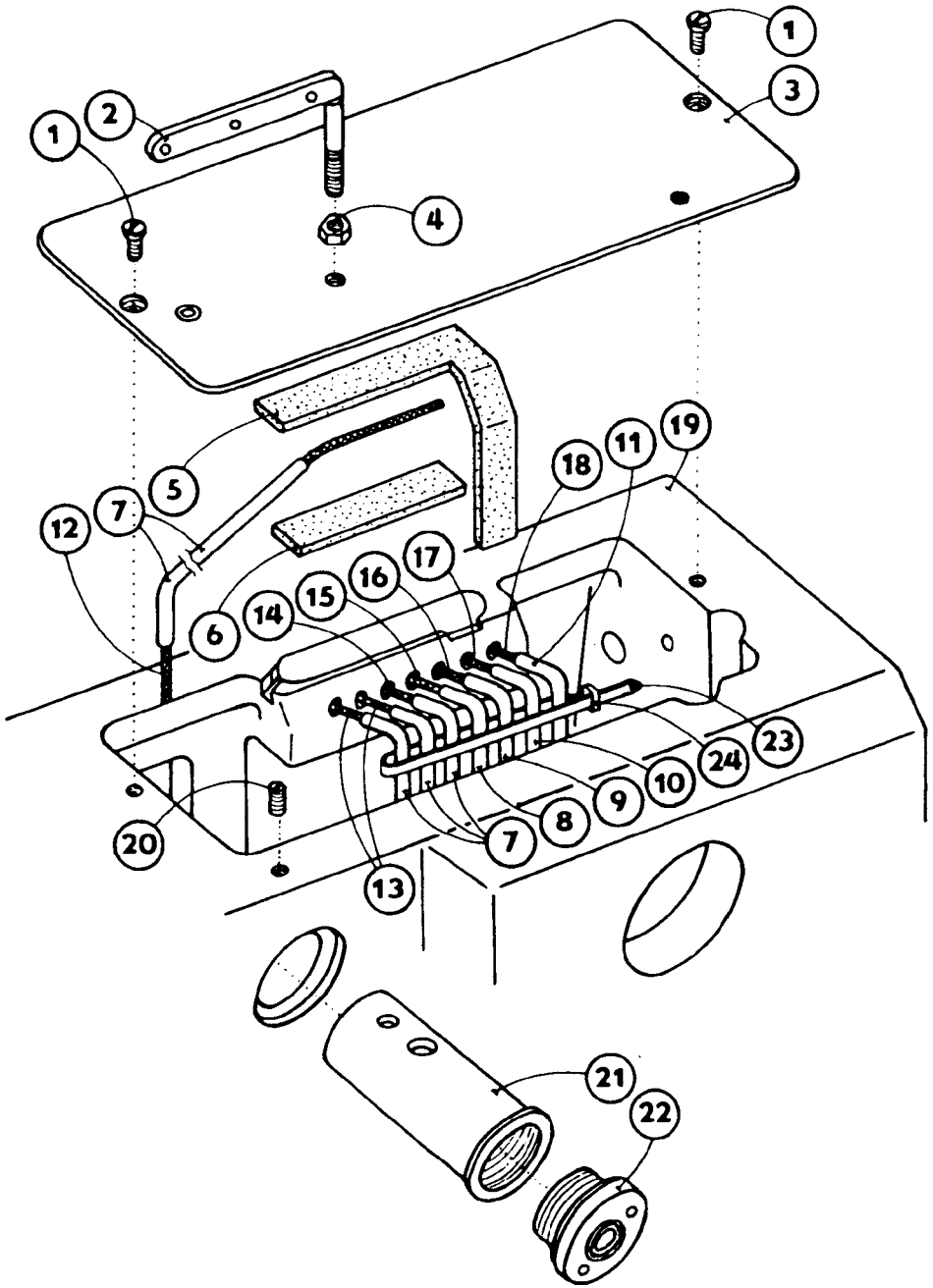
22	S080	126069
23	S311	733620

tab. 2



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6	S080	945316
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8	S283	002001
	ø 3,5/ø 4,8 x 250 mm	
9	S283	002001
	ø 3,5/ø 4,8 x 290 mm	
10	S283	002001
	ø 3,5/ø 4,8 x 360 mm	
11	S283	002001
	ø 3,5/ø 4,8 x 280 mm	
12	S708	130002
	ø 2 x 180 mm	
13	S708	130002
	ø 2 x 200 mm	
14	S708	130002
	ø 2 x 150 mm	
15	S708	130002
	ø 2 x 300 mm	
16	S708	130002
	ø 2 x 330 mm	
17	S708	130002
	ø 2 x 400 mm	
18	S708	130002
	ø 2 x 320 mm	
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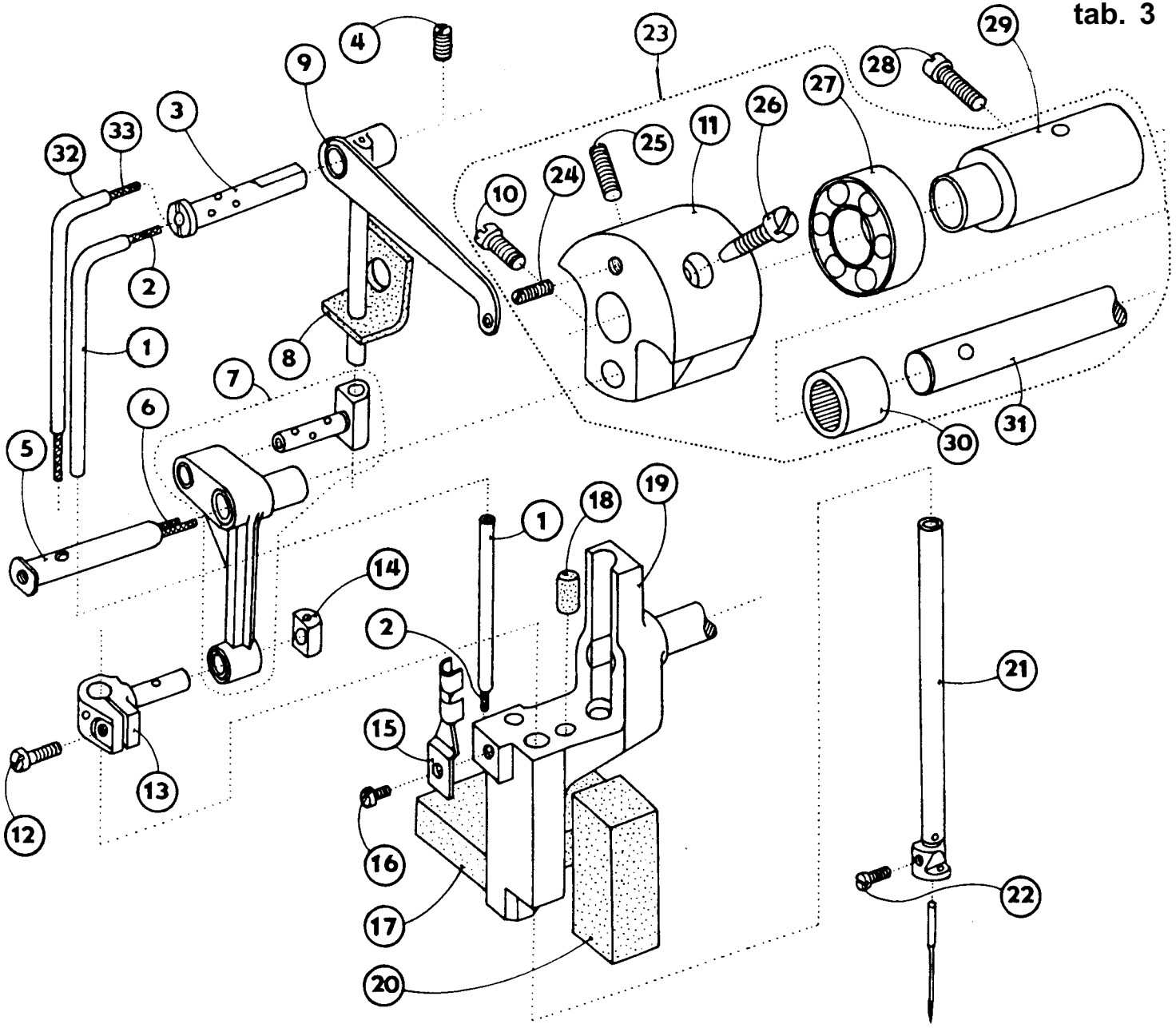
21	S080	421352
22	S321	001000
23	S562	411000
24	S562	260000



317 - 101

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2	S708	130002
	ø 2 x 300 mm	
3	S080	328005
4	S080	111247
5	S980	044726
6	S708	130002
	ø 2 x 80 mm	
7	S980	044702
8	S080	945328
9	S980	021343
10	S080	122008
12	S080	124050
13	S080	337043
14	S080	646137
15	S080	824367
16	S080	120296
17	S080	953191
18	S080	945077
19	S980	044907
20	S080	953052
21	S080	391158
22	S080	120530
23	S980	035501
24	S080	111238
25	S080	112015
26	S080	138009
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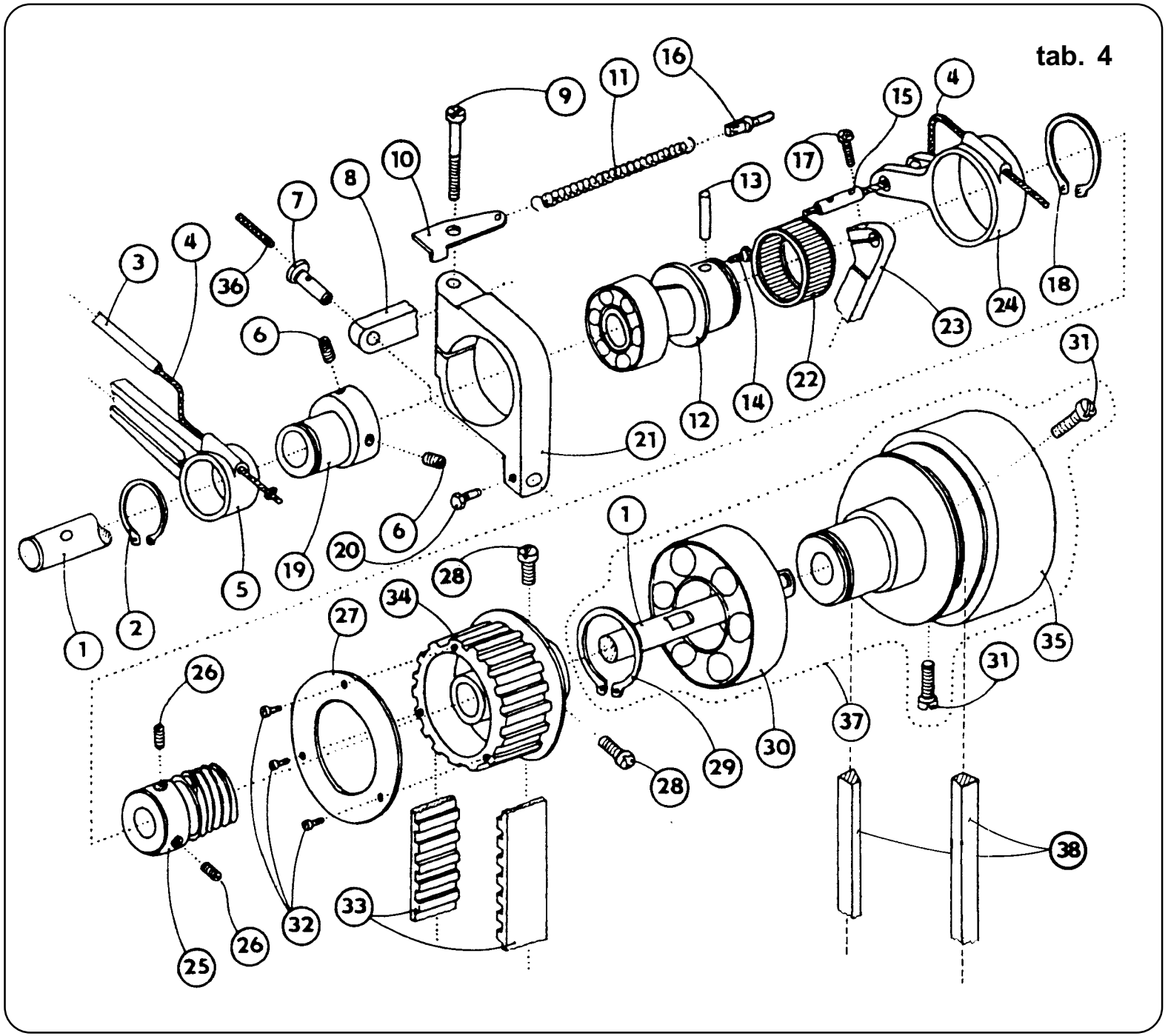
33	S708	130002
	ø 2 x 150 mm	



317 - 101

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3	S283	002001
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4	S708	130002
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5	S080	630256
6	S080	112014
7	S080	328110
8	S080	384075
9	S080	120222
10	S080	825791
11	S080	263145
12	S980	035538
13	S080	318103
14	S080	141088
15	S080	413340
16	S080	152080
17	S080	120226
18	S311	733280
19	S080	338191
20	S080	141102
21	S080	627171
22	S324	512900
23	S080	613486
24	S080	630257
25	S080	570058
26	S080	111247
27	S080	814327
28	S080	122029
29	S311	733300
30	S324	060093
31	S080	120006
32	S080	120216
33	S272	032015
34	S980	045328
35	S080	511099
36	S708	130003
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37	S980	045388
38	S272	225001
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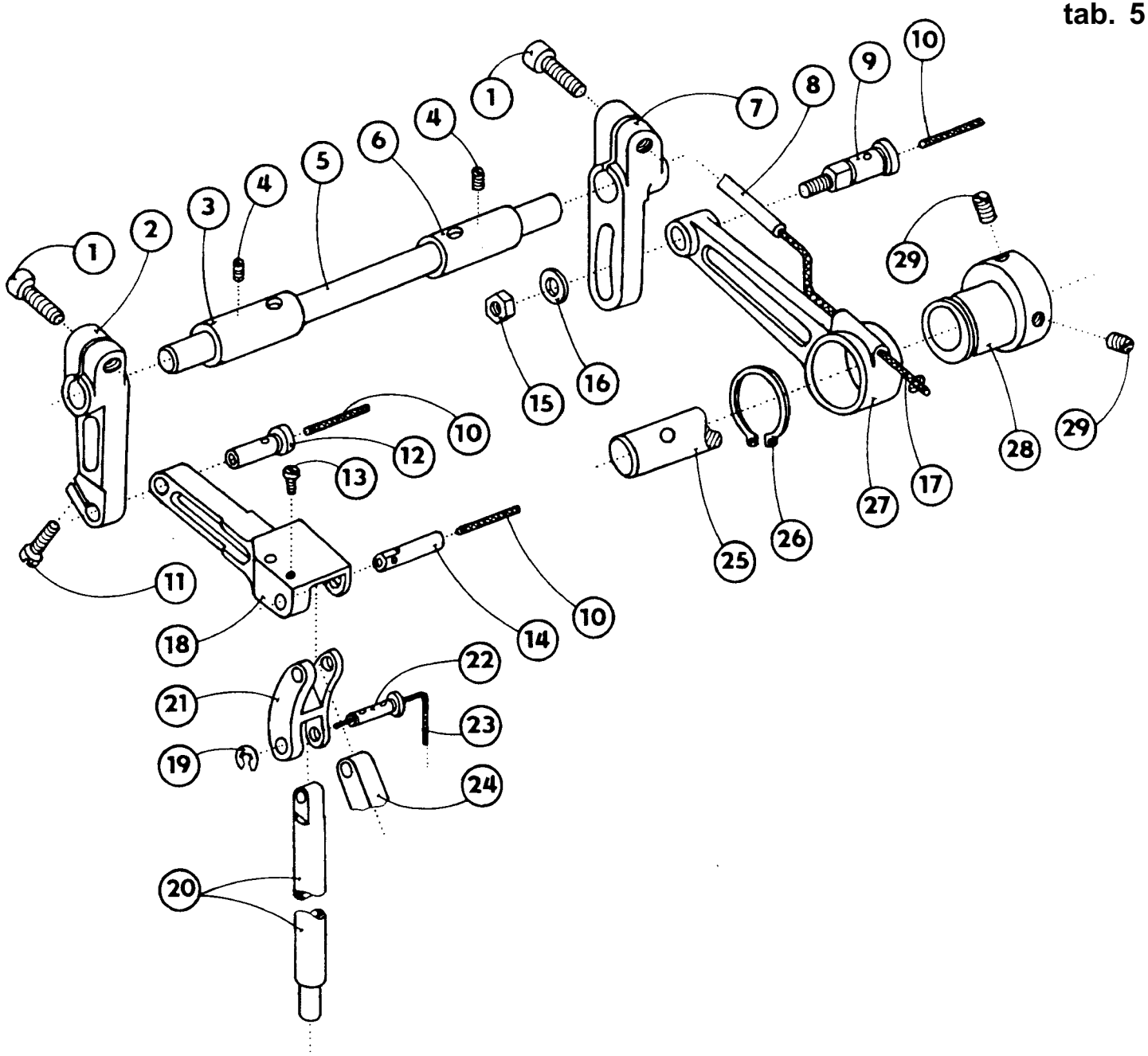
tab. 5



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5	S080	342260
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8	S283	002001
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9	S080	335115
10	S708	130002
	ø 2 x 20 mm	
11	S080	120226
12	S080	328110
13	S080	120296
14	S080	328179
15	S080	161142
16	S080	190346
17	S708	130002
	ø 2 x 200 mm	
18	S080	630254
19	S080	274090
20	S080	392108
21	S080	612347
22	S080	322271
23	S708	001001
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27	S080	630256
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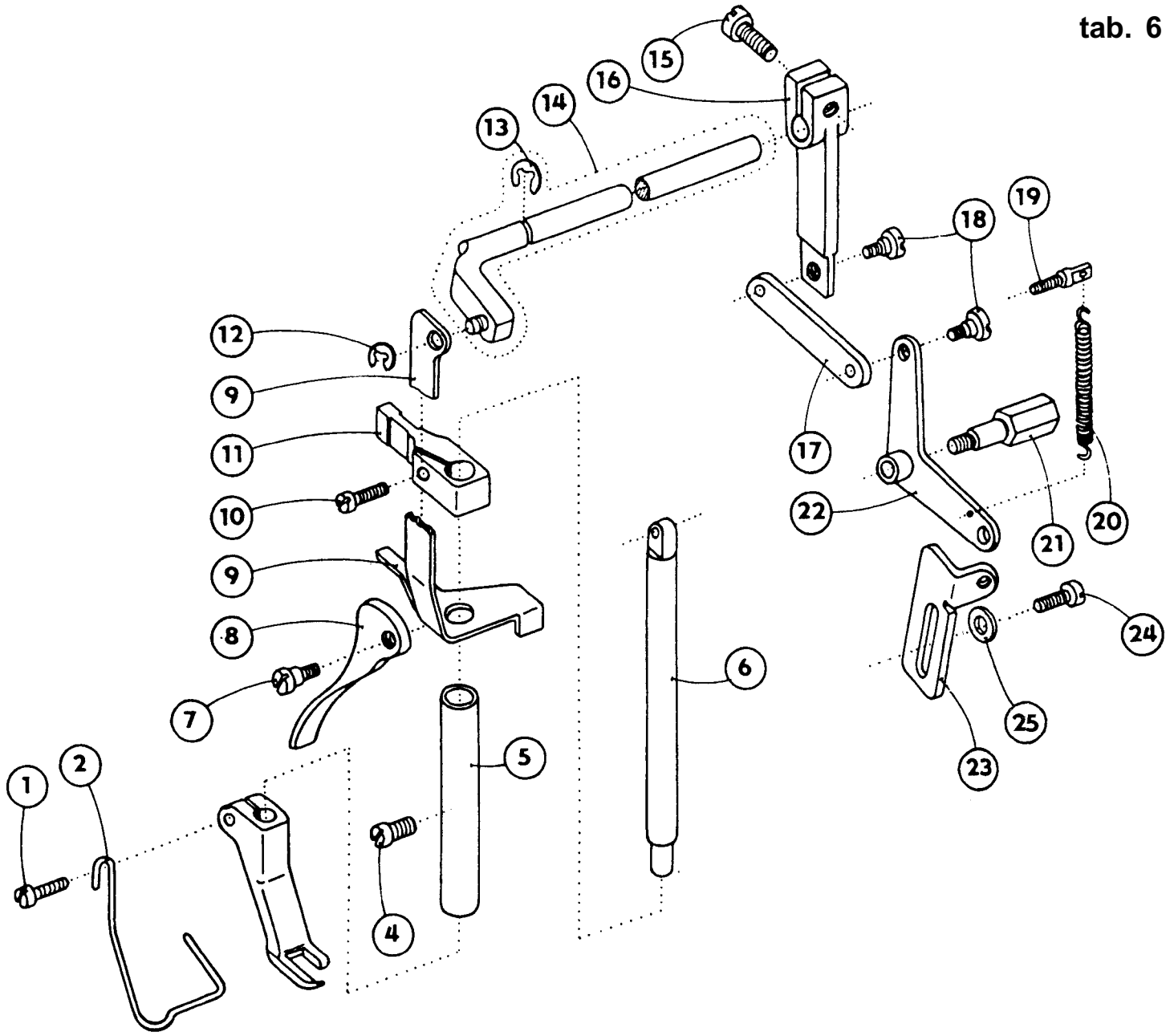
tab. 6



317 - 101

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5	S080	410573
6	S080	392108
7	S080	136023
8	S080	615021
9	S080	839053
10	S080	120227
11	S080	623205
12	S080	274090
13	S080	274084
14	S980	044851
15	S080	120233
16	S080	613487
17	S080	384077
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19	S080	152080
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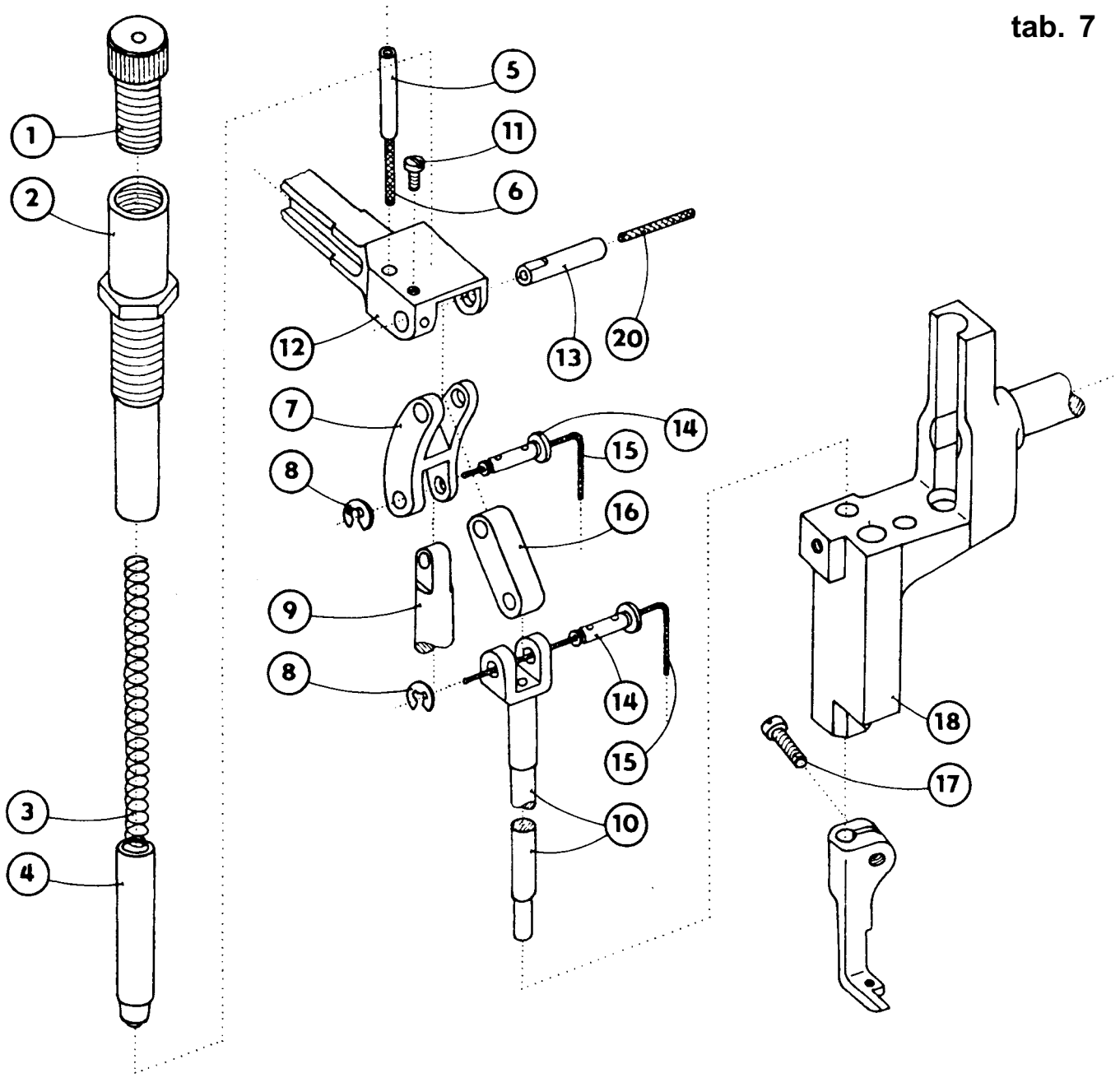

317 - 101

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	ø 2 x 150 mm	
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8	S080	274090
9	S080	392108
10	S080	392106
11	S080	120296
12	S080	630254
13	S080	328179
14	S080	322271
10	S708	001001
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18	S980	044907
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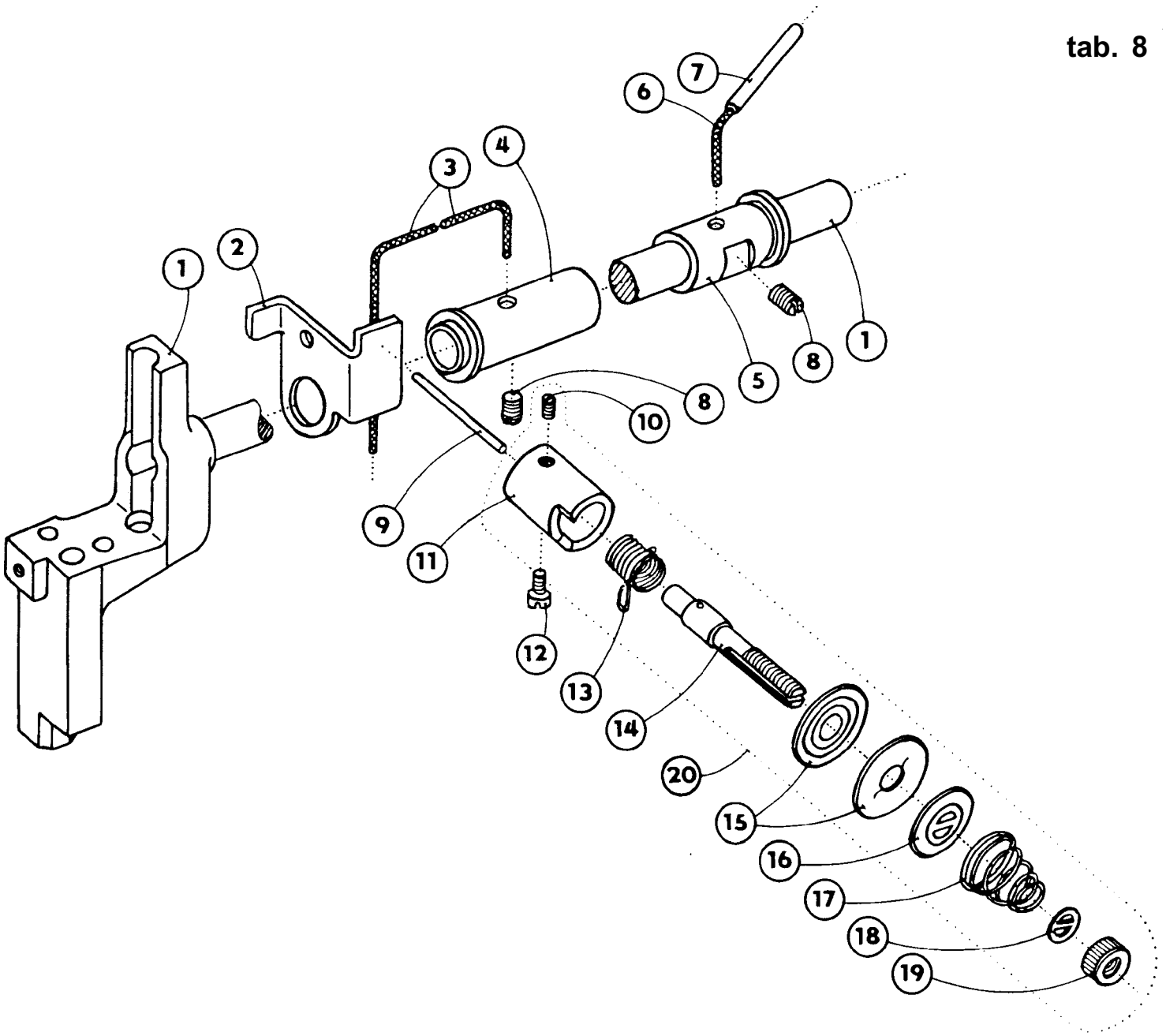
	ø 2 x 20 mm	

tab. 8



317 - 101

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5	S080	413331
6	S708	130002
	ø 2 x 200 mm	
7	S283	002001
	ø 3,5/ø 4,8 x 100 mm	
8	S080	111247
9	S080	310270
10	S080	111227
12	S080	120266
13	S315	264294
15	S080	828079
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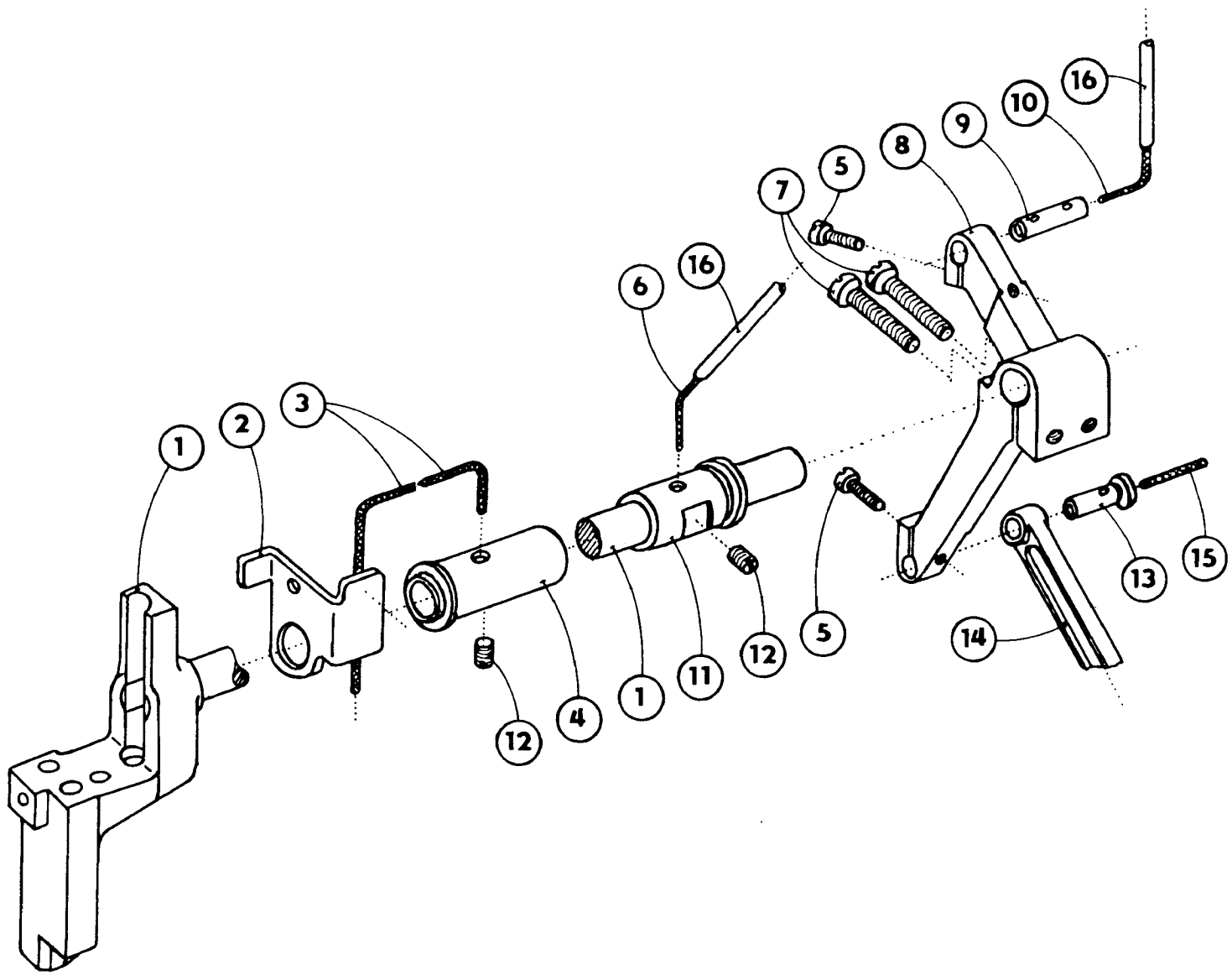

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9	S080	413340
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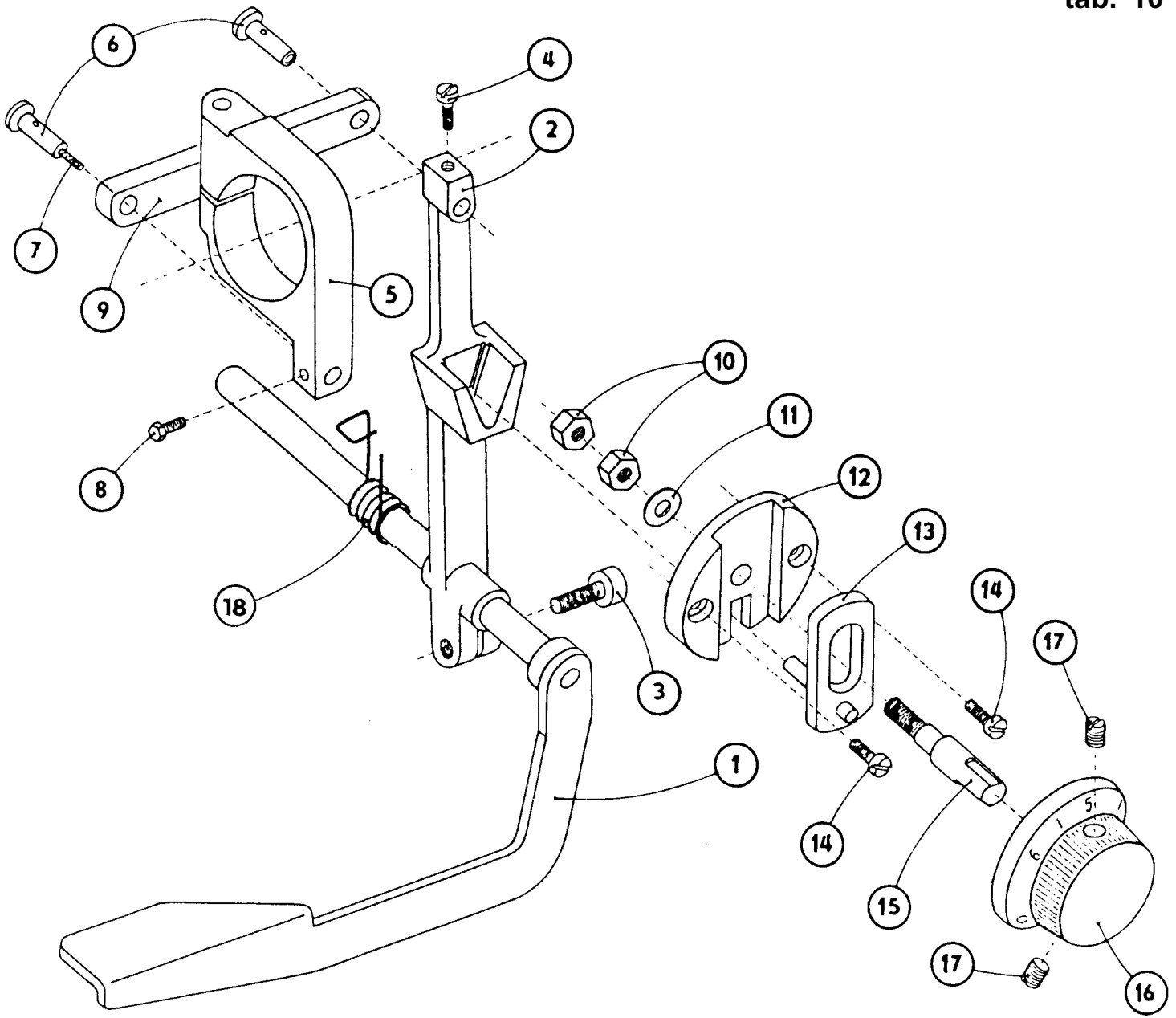
tab. 10



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11	S080	192061
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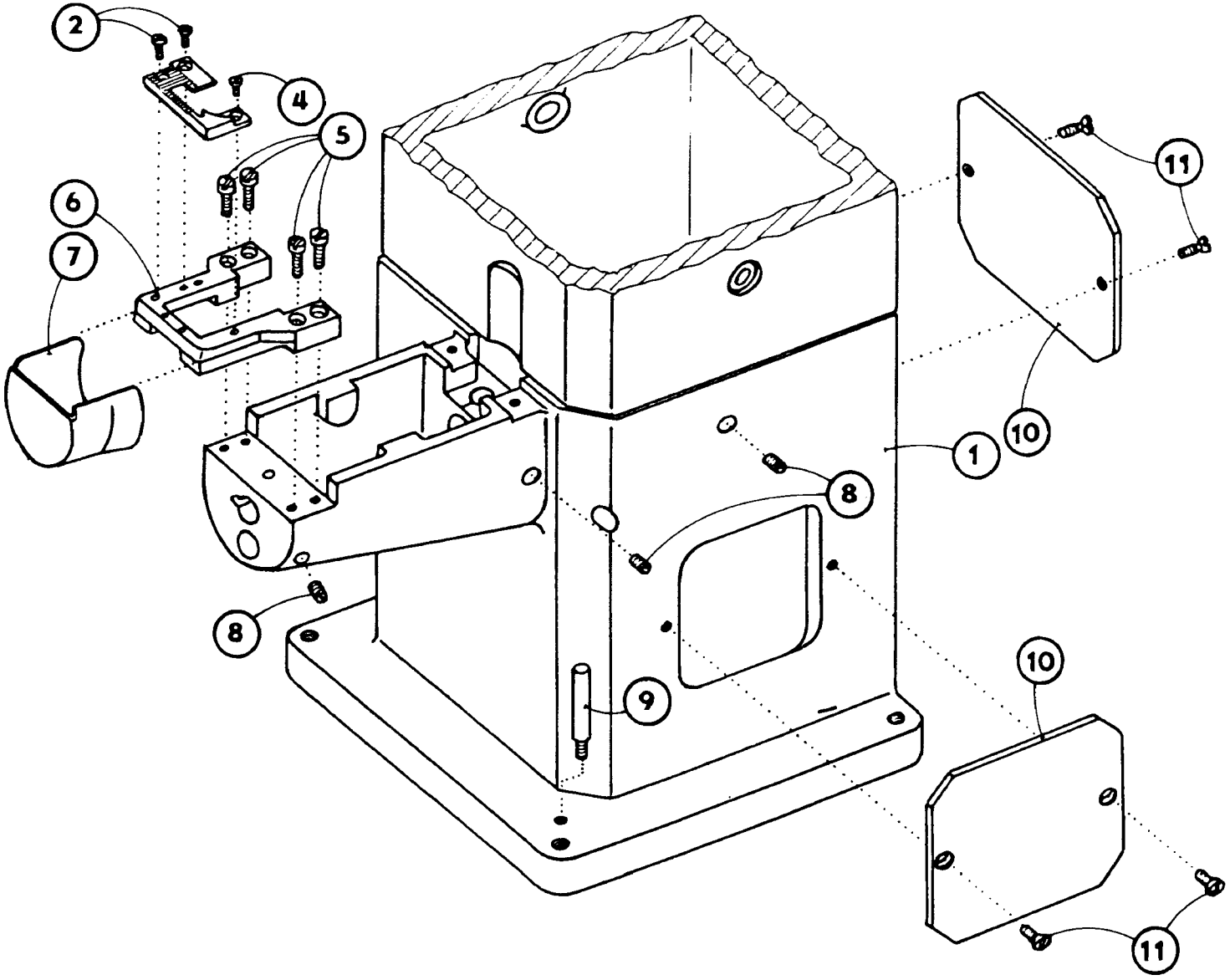

317 - 101

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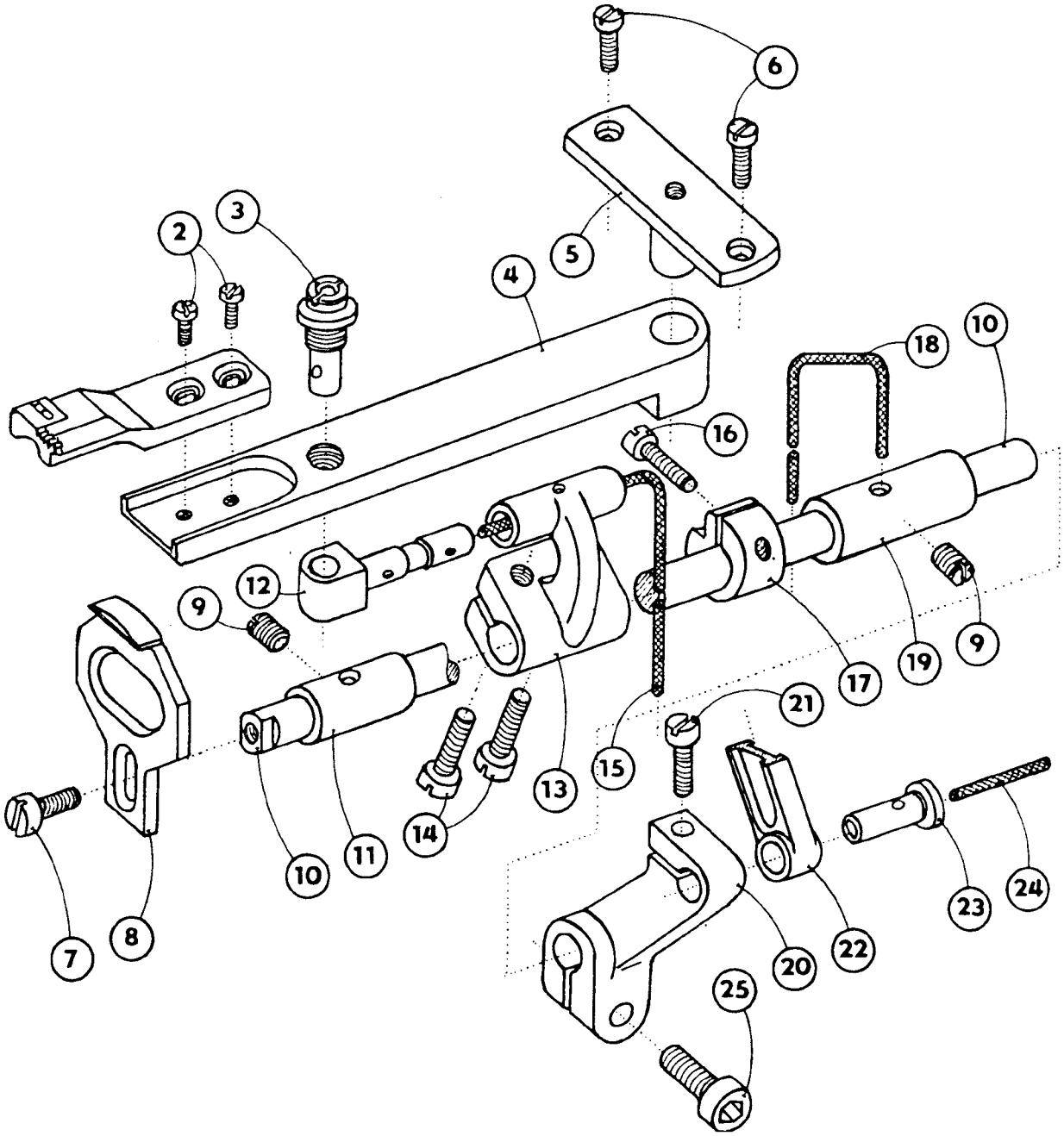
5	S080	120226
6	S080	646162
7	S980	057011
8	S080	111247
9	S080	313301
10	S080	831443
11	S080	123117

tab. 12



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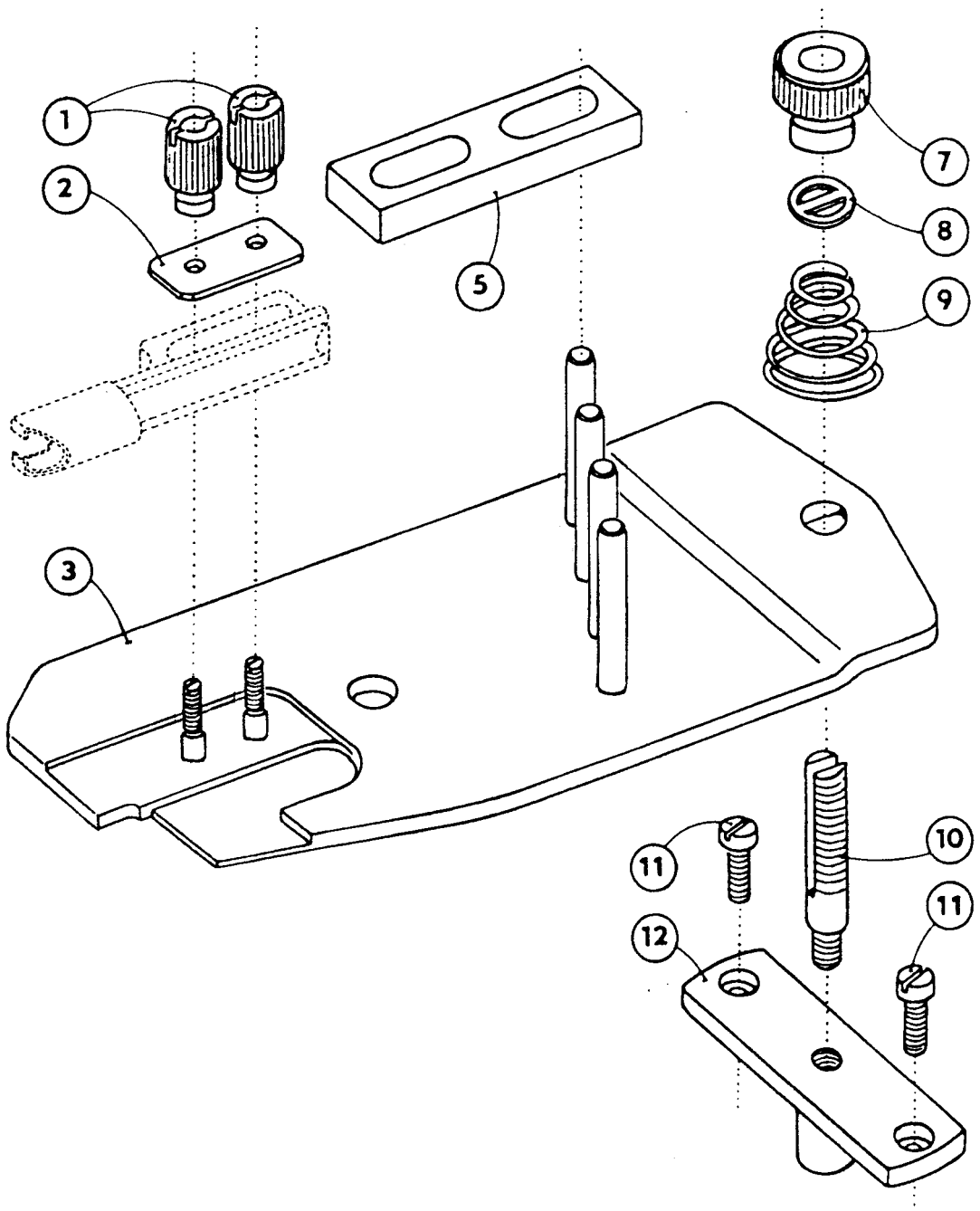
2	S080	120014
3	S080	335114
4	S080	648109
5	S080	744409
6	S080	124050
7	S080	120059
8	S080	744410
9	S080	111247
10	S080	341218
11	S080	413335
12	S080	337087
13	S080	635175
14	S080	120230
15	S708	130002
	ø 2 x 90 mm	
16	S080	120071
17	S080	436035
18	S708	130002
	ø 2 x 80 mm	
19	S080	413333
20	S080	613493
21	S080	120226
22	S080	613492
23	S080	328110
24	S708	130002
	ø 2 x 20 mm	
25	S080	120457

tab. 13



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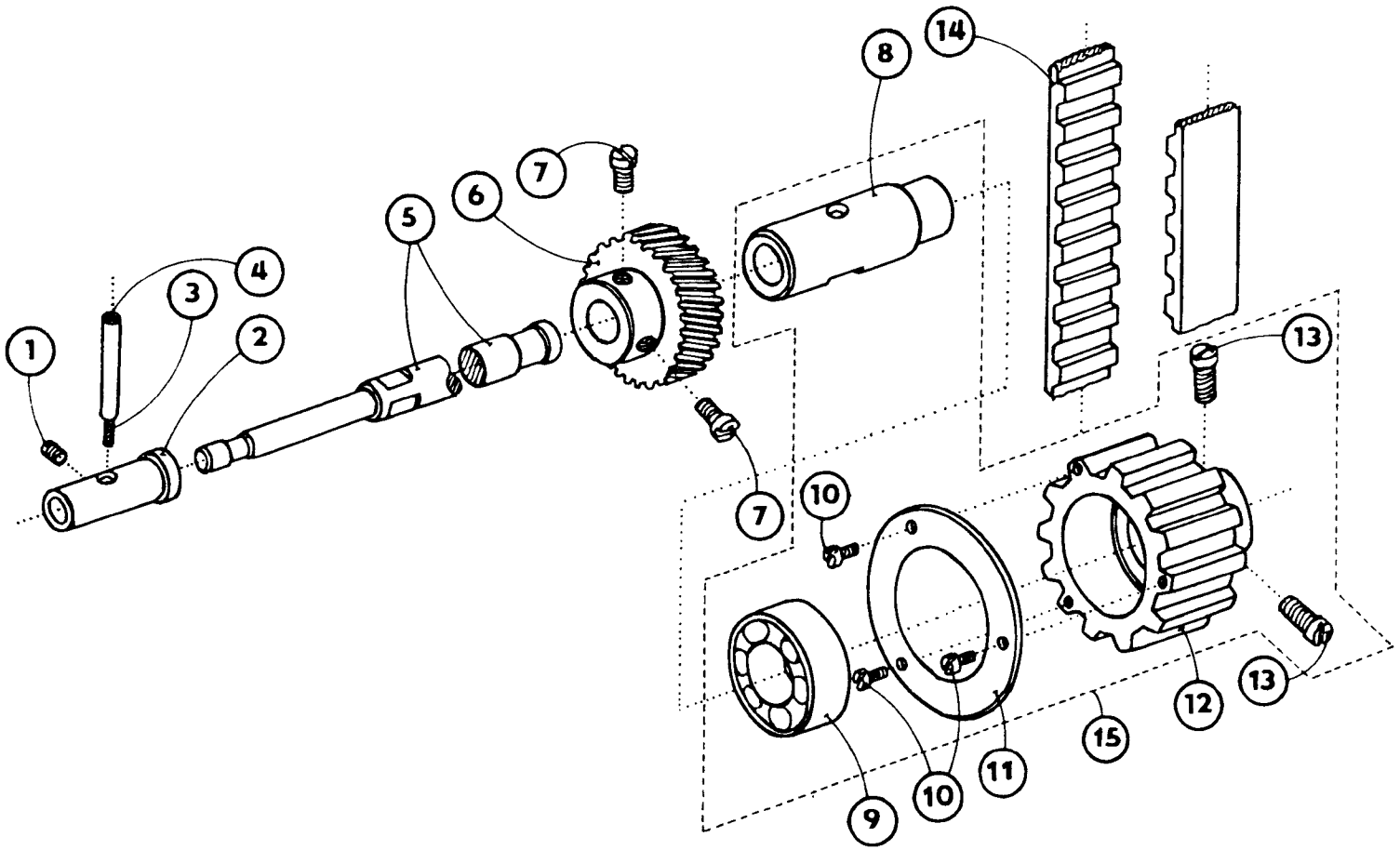
1	S080	172014
2	S080	190614
3	S980	041270
5	S080	953192
7	S080	172016
8	S080	195041
9	S080	262040
10	S080	328178
11	S080	124050
12	S080	744409

tab. 14



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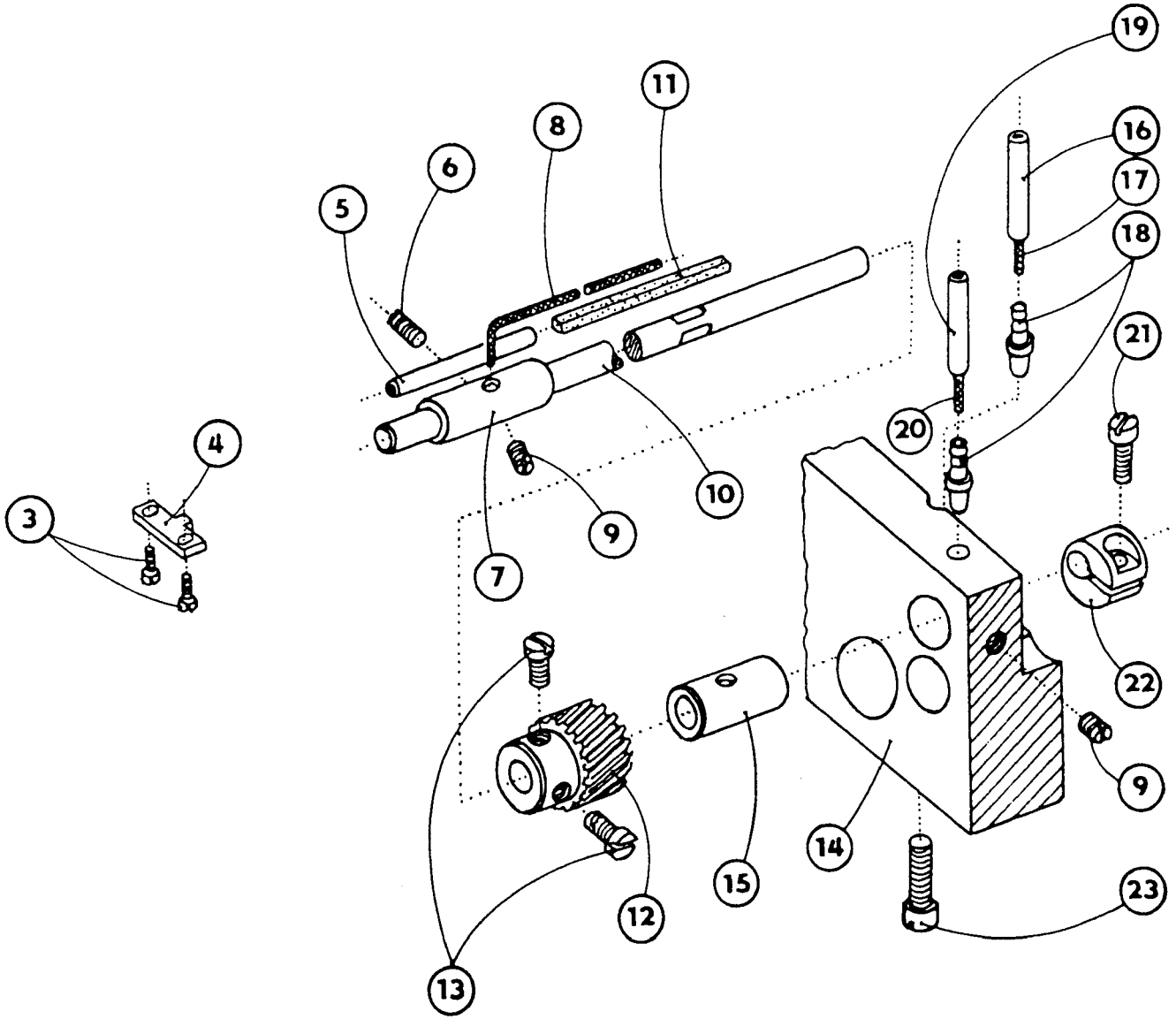
1	S080	111229
2	S080	413343
3	S708	130002
	ø 2 x 330 mm	
8	S283	002001
	ø 3,5/ø 4,8 x 290 mm	
5	S080	342259
6	S080	551154
7	S080	122007
8	S080	422213
10	S080	120216
11	S080	814327
12	S080	554093
13	S080	122029
14	S272	032015
15	S980	045504

tab. 15



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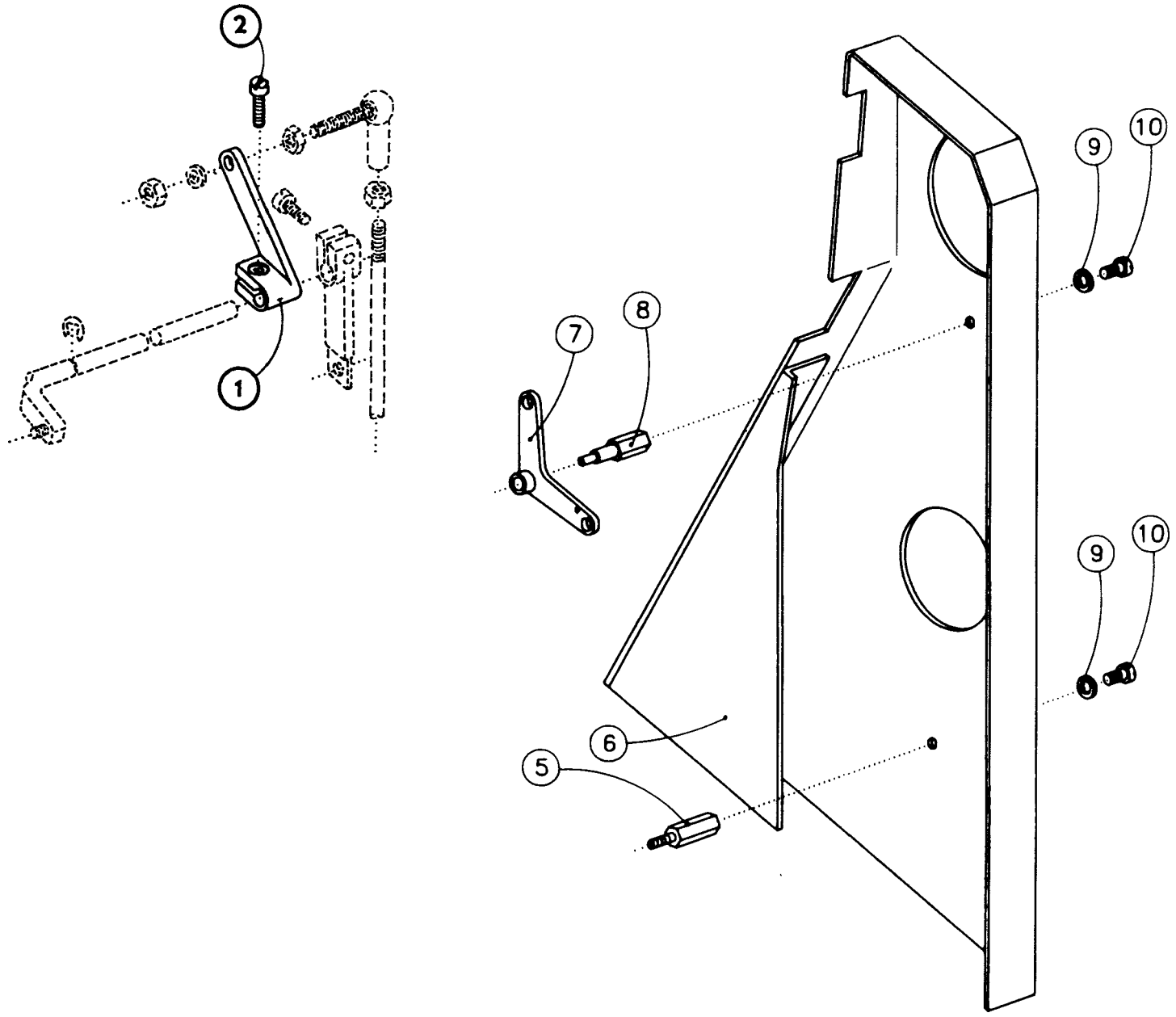
3	S080	120403
4	S080	647229
5	S324	840271
6	S080	111251
7	S080	413332
8	S708	002105
	ø 1,5 x 120 mm	
9	S080	111247
10	S080	340164
11	S080	945323
12	S080	551155
13	S311	122007
15	S080	413334
16	S283	002001
	ø 3,5/ø 4,8 x 280 mm	
17	S708	130002
	ø 2 x 320 mm	
18	S080	424051
19	S283	002001
	ø 3,5/ø 4,8 x 250 mm	
20	S708	130002
	ø 2 x 300 mm	
21	S080	120226
22	S080	436355
23	S080	120006

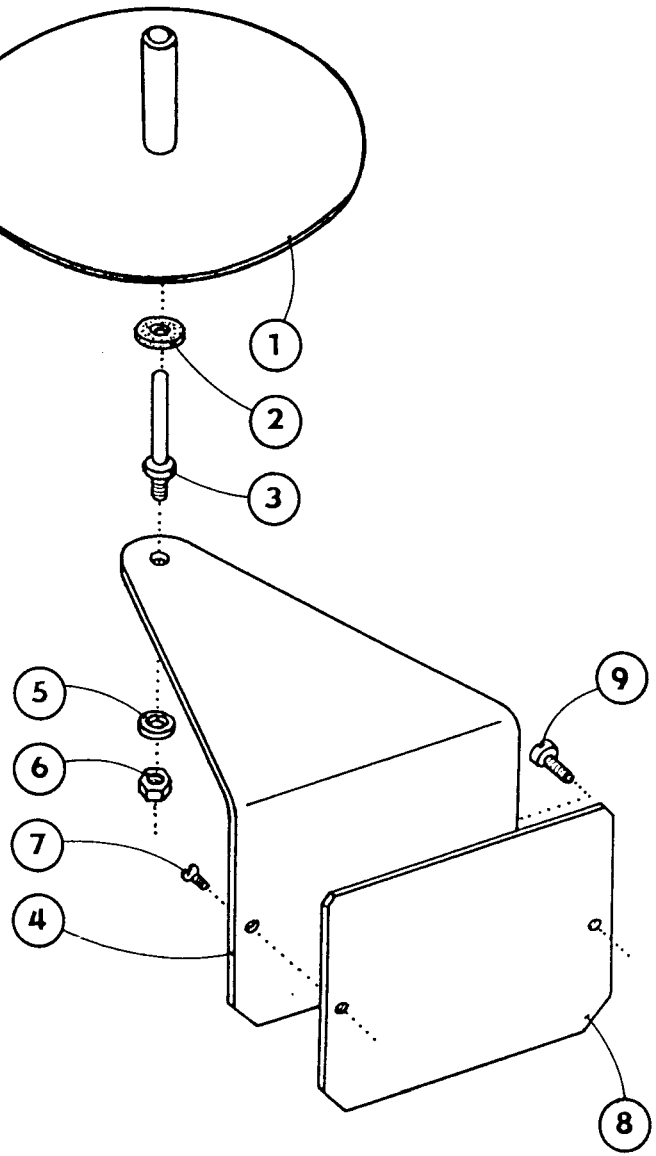
tab. 16



317 - 101

1	S080	635272
2	S080	120248
5	S080	331162
6	S980	057138
7	S980	048955
8	S080	120550
9	S080	190359
10	S080	120259

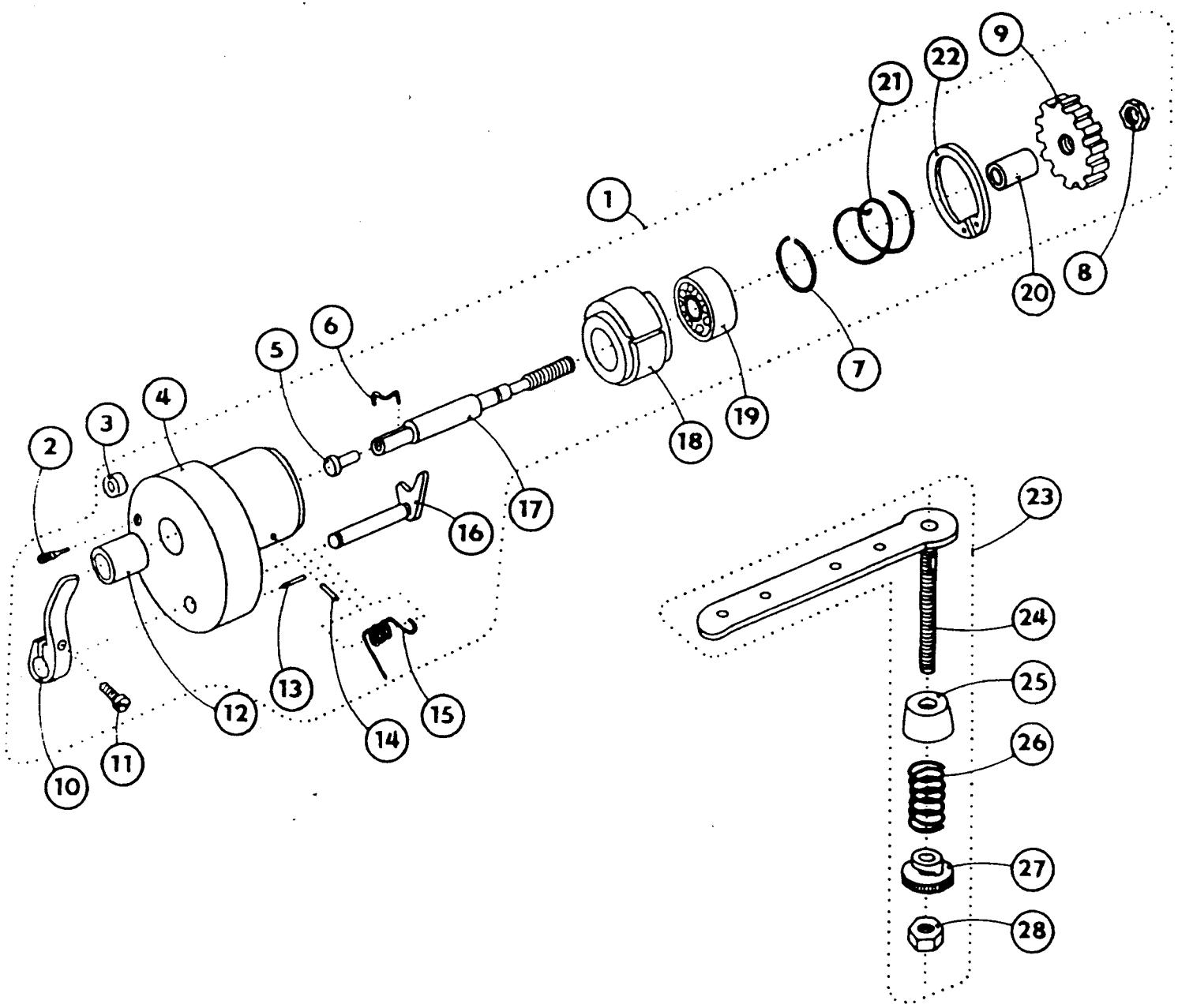
tab. 17



317 - 101

1	S980	035540
2	S080	945294
3	S080	316102
4	S080	825963
5	S080	190347
6	S080	161163
7	S080	123117
8	S080	941119
9	S080	120227

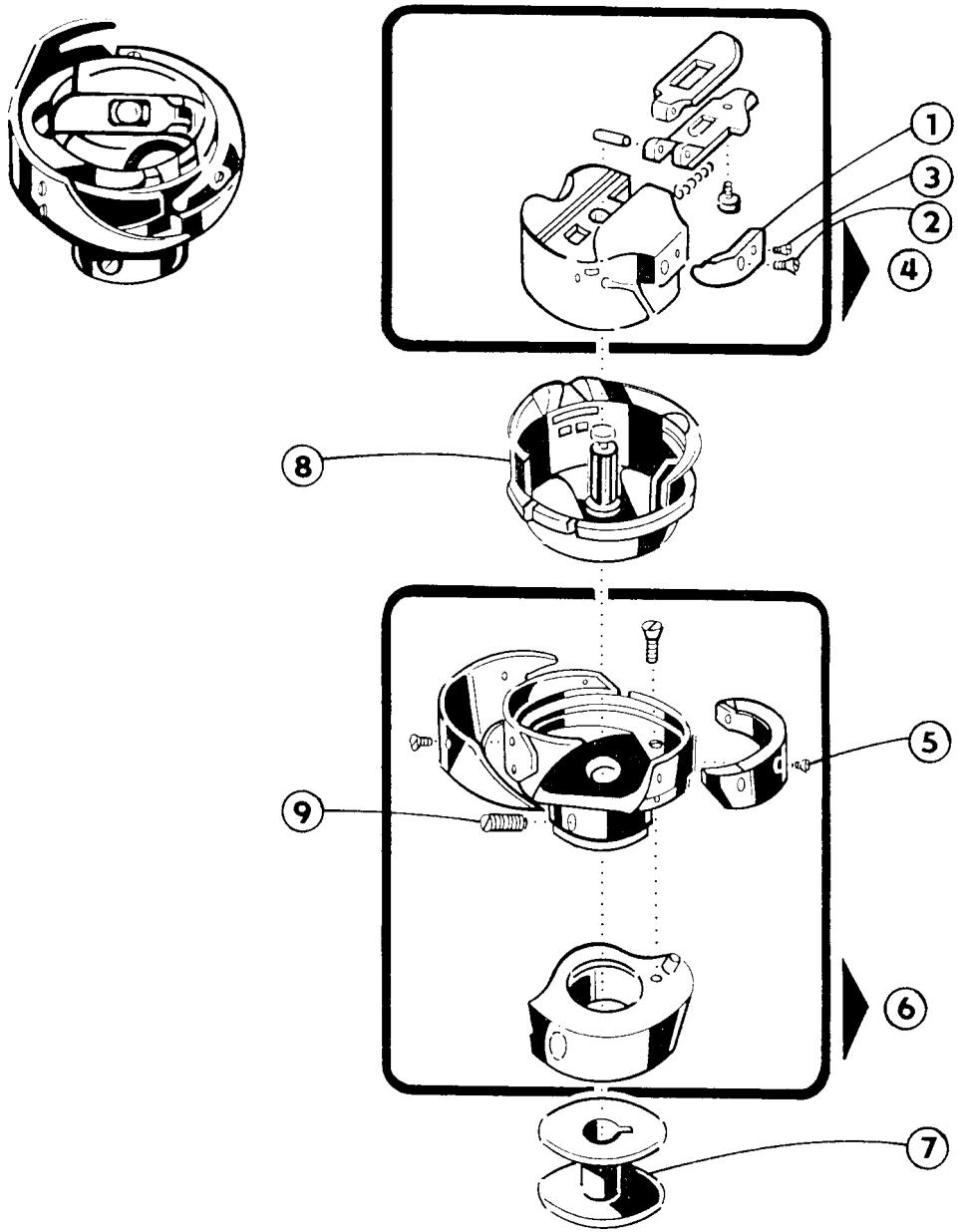
tab. 18



317 - 101

1	S980	036097
2	S080	131163
3	S080	416135
4	S080	442336
5	S321	953200
6	S080	265037
7	S311	732014
8	S080	161137
9	S080	551047
10	S080	613179
11	S080	120252
12	S323	081210
13	S311	515095
14	S311	515089
15	S080	264243
16	S980	049501
17	S080	335108
18	S080	424075
19	S324	870000
20	S080	410641
21	S080	260378
22	S311	733181
23	S980	025249
24	S980	025249
25	S080	827194
26	S080	260510
27	S080	163106
28	S080	161138

tab. 19

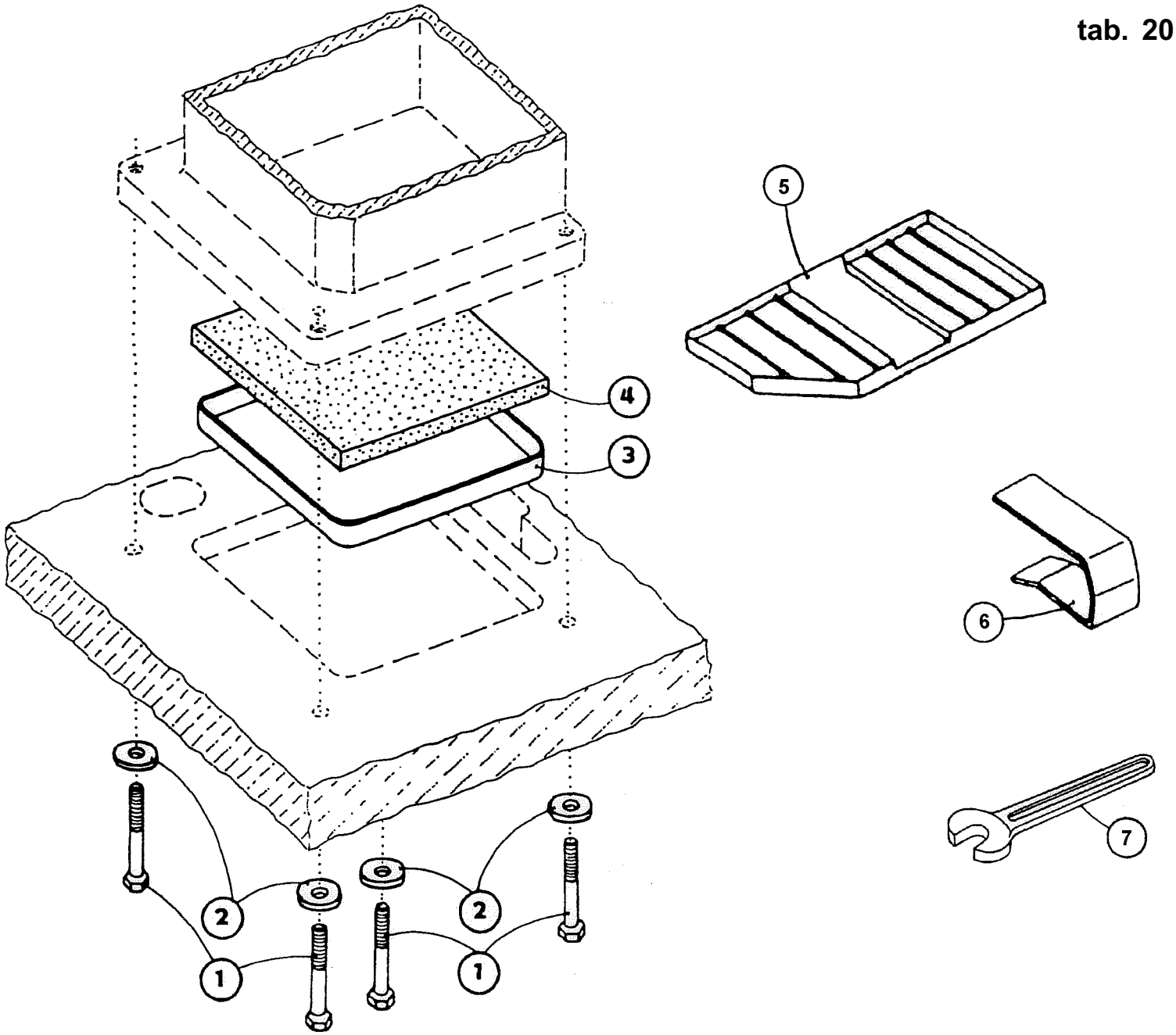


317 - 101

S522 000235

1	S522 006008
2	S522 000006
3	S522 006010
4	S522 006036
5	S522 005227
6	S522 005404
7	S080 685017
8	S522 005413
9	S522 005229
10	S522 005406

tab. 20

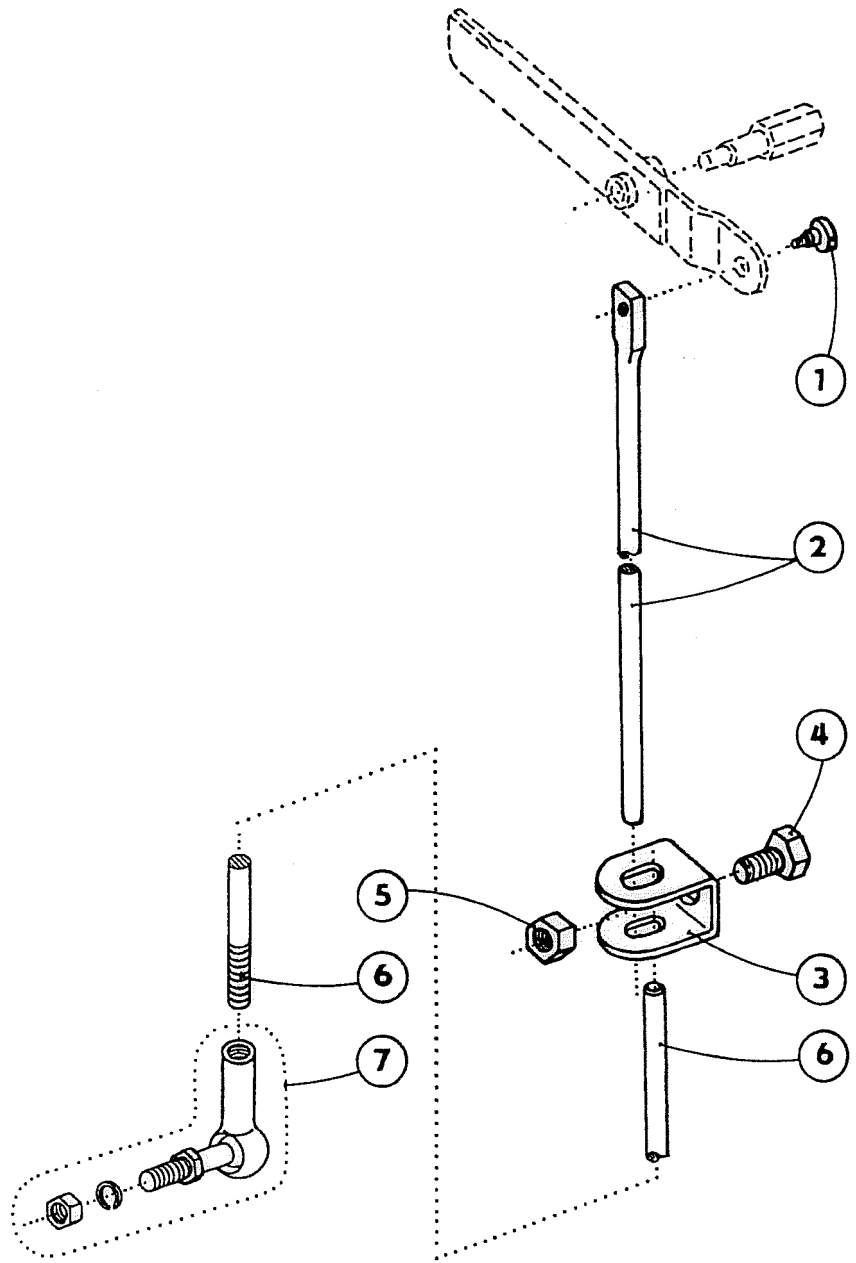


317 - 101

S791 995140 /1

1	S080	141168
2	S080	190441
3	S080	836381
4	S080	953206
5	S321	953251
6	S080	826387
7	S413	100130

tab. 21

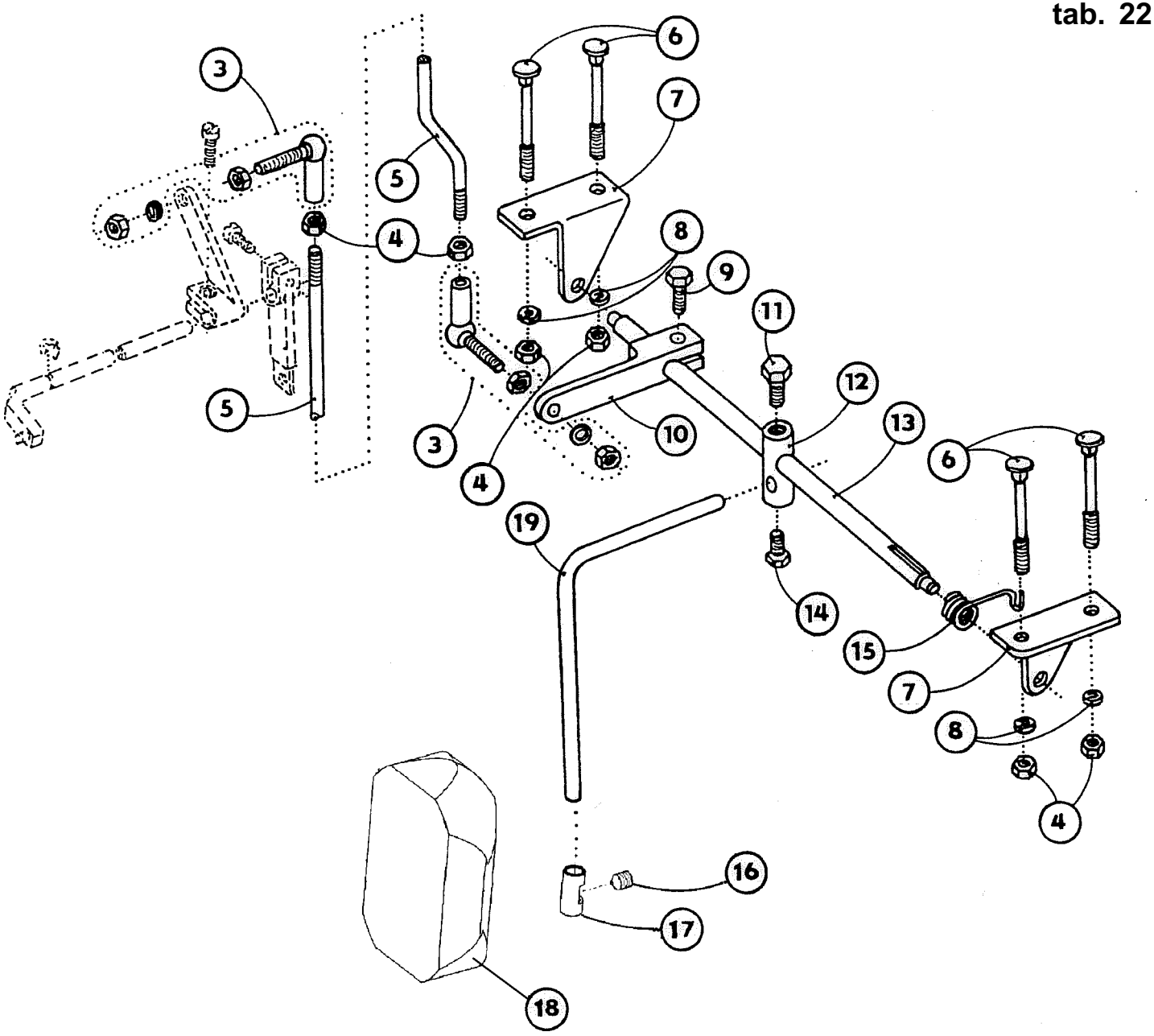


317 - 101

S791 995140/2

1	S080	131333
2	S080	384076
3	S080	839175
4	S080	141307
5	S321	336002
6	S080	381148
7	S443	000006

tab. 22

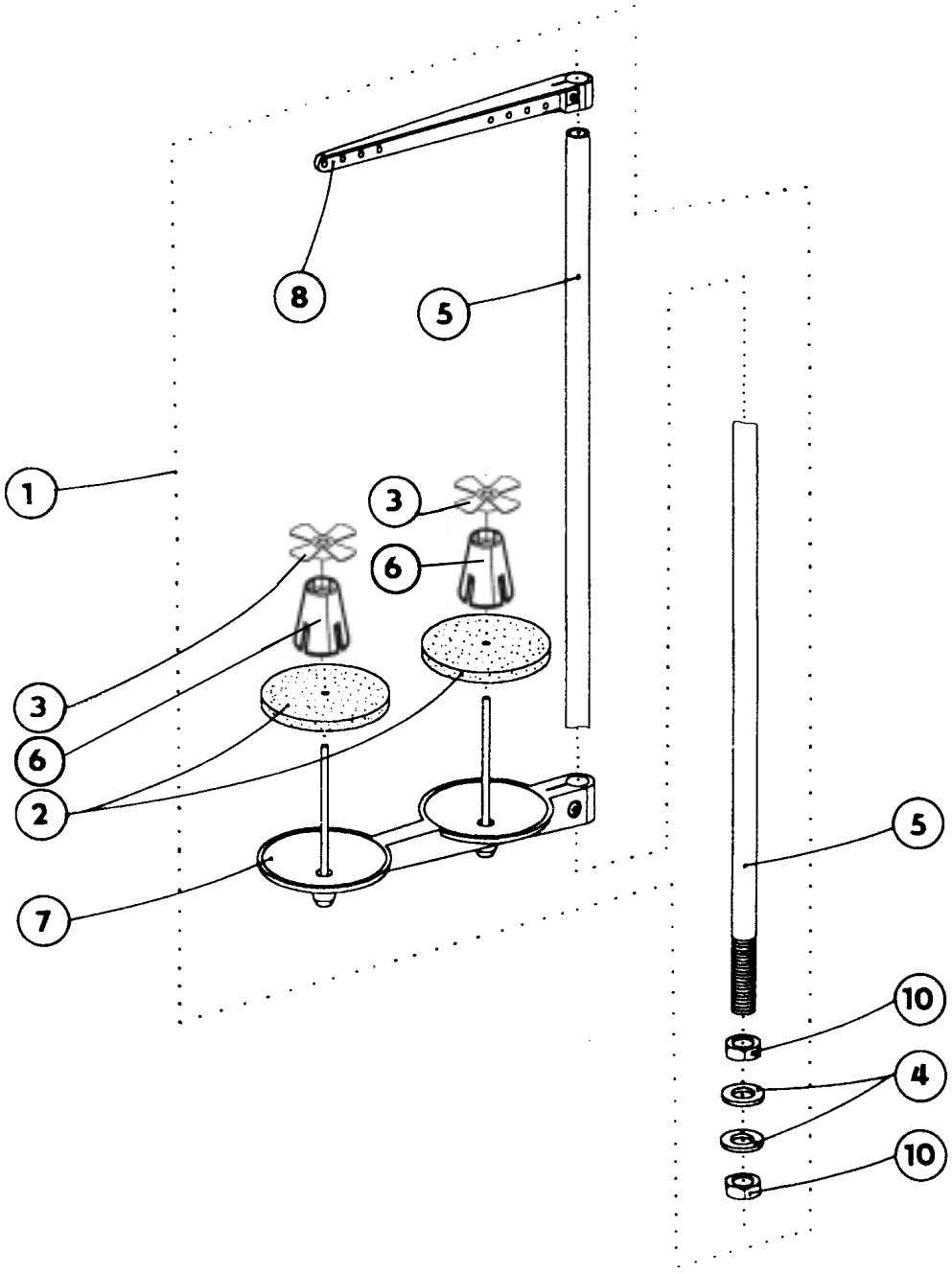


317 - 101

S791 995140/3

3	S443	000006
4	S080	161142
5	S080	382098
6	S080	141129
7	S080	826298
8	S080	191108
9	S080	141133
10	S080	613561
11	S080	141123
12	S080	318069
13	S080	342136
14	S080	141141
15	S080	264159
16	9205	102788
17	S080	416146
18	0223	000486
19	S080	383022

tab. 23

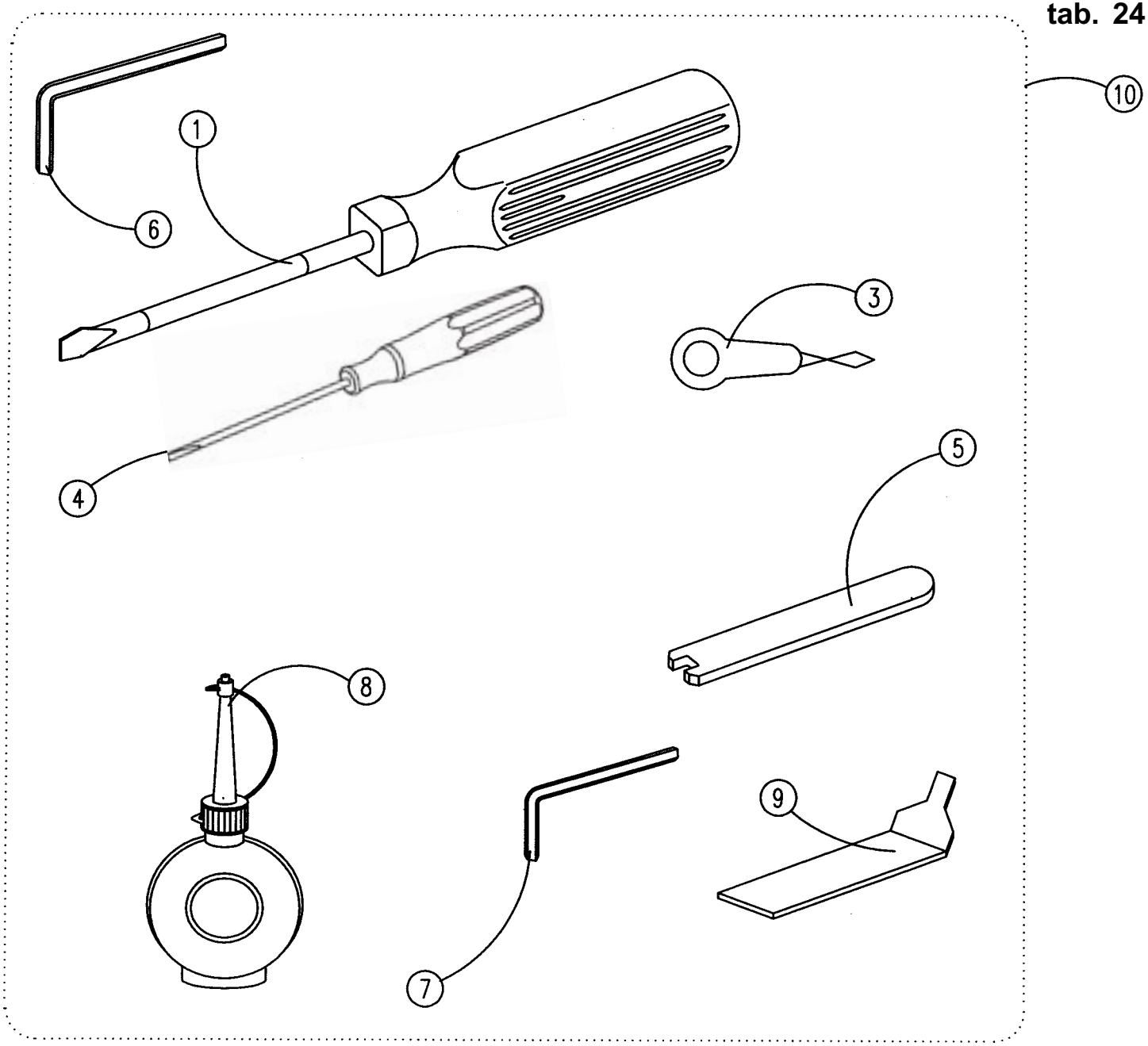


317 - 101

S791 995140/4

1	S981	036162	
2	0077	110220	2 x
3	0077	110230	2 x
4	9330	000177	
5	0791	001081	
6	0791	580100	2 x
7	0791	001091	
8	0791	001096	
10	0995	340617	

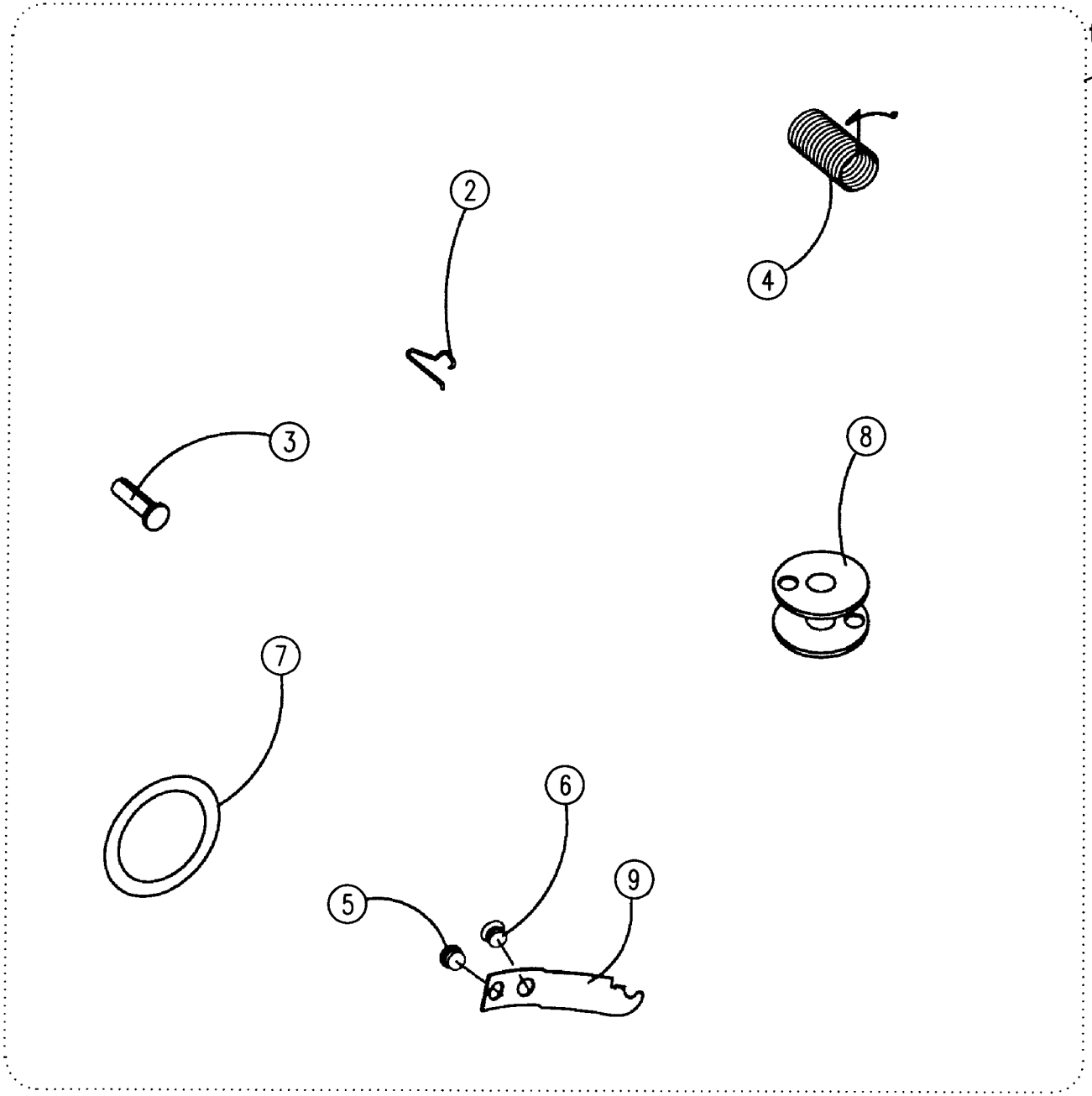
tab. 24



317 - 101

S791995140/5

1	S413	731023
3	S548	001000
4	9081	500010
5	S080	813481
6	S413	000500
7	S413	000400
8	S562	002000
9	S080	829796
10	**S980**	**092220**

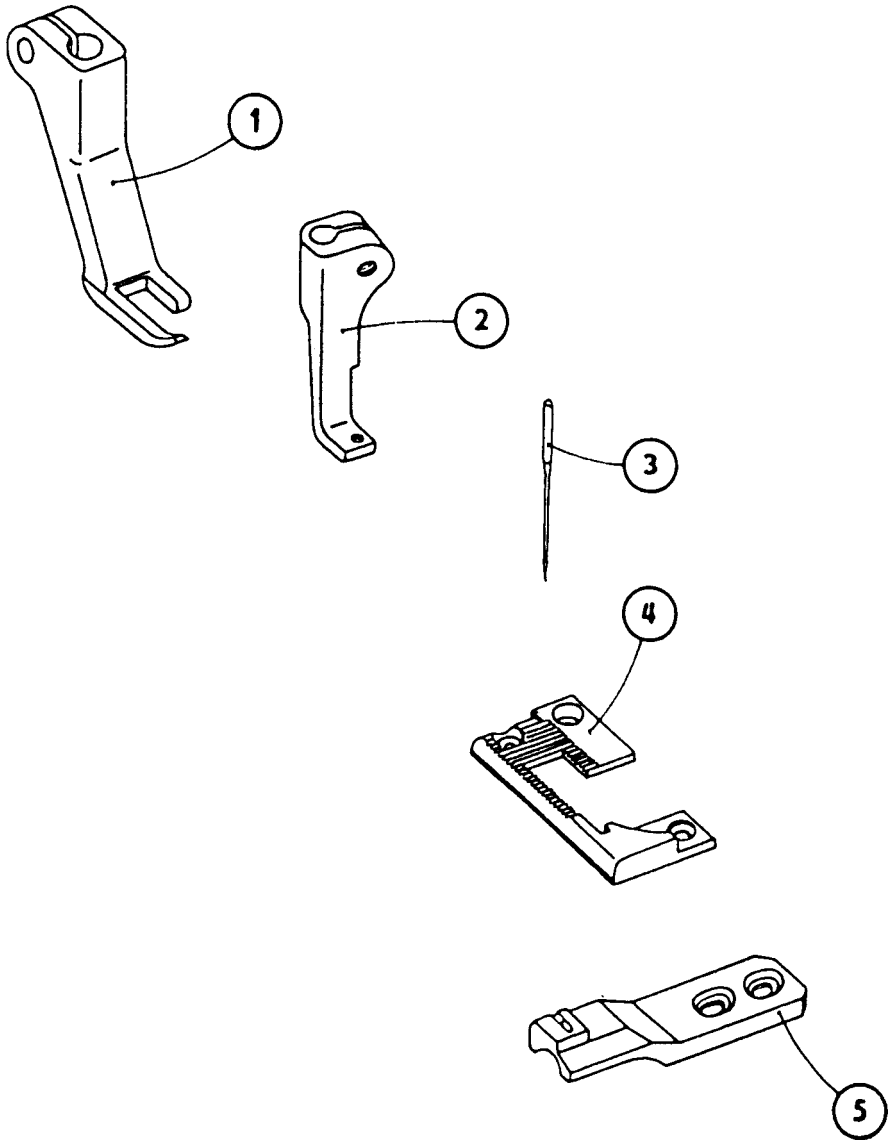


tab. 25

317 - 101

1	**S980**	**092235**	
2	S080	265037	4 x
3	S321	953200	2 x
4	S315	264294	4 x
5	S522	006010	4 x
6	S522	000006	4 x
7	S273	025410	4 x
8	S080	685017	10 x
9	S522	006008	4 x

tab. 26



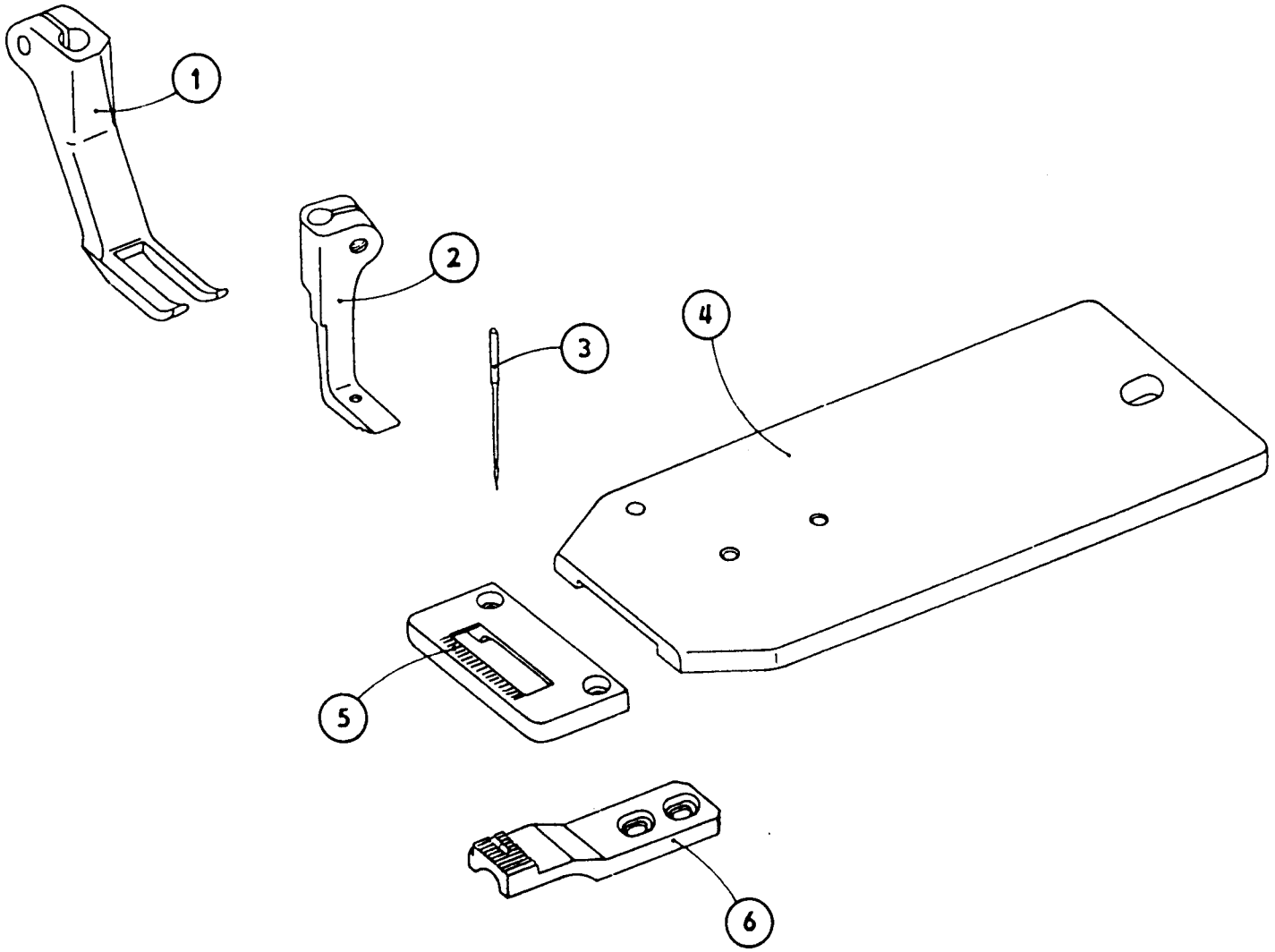
317 - 101

317 E 043

S791 124043 35

1	S080	667134
2	S080	667166
3	134 No. 110 - 11 x	
4	S080	811638
5	S080	651483

tab. 27



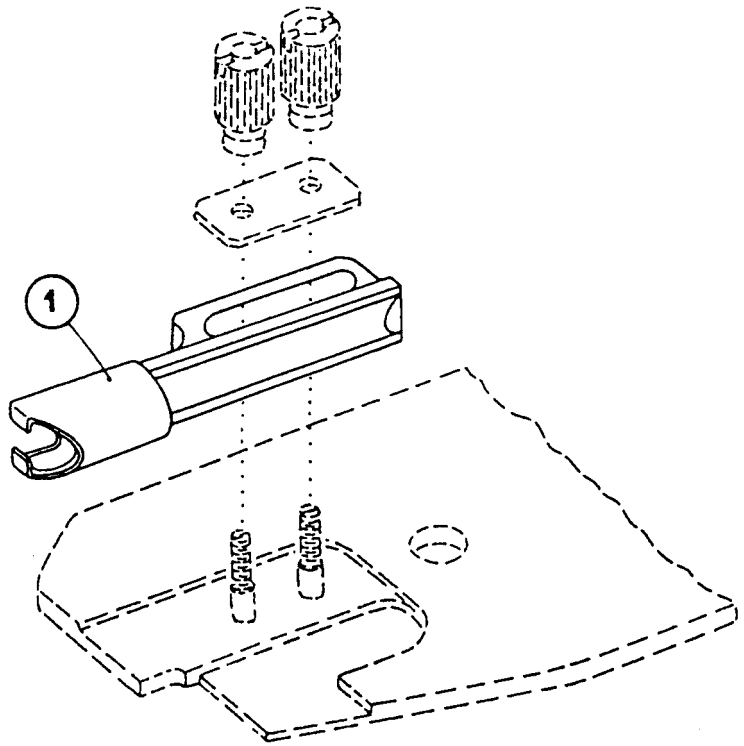
317 - 101

317 E 046

S791 12404635

1	S080	667141
2	S080	667142
3	134 No. 110 - 11 x	
4	S980	061210
5	S080	811656
6	S080	651479

tab. 28



317 - 101

317 N 007
S791 705007
1 S980 049064

317 N 008
S791 705008
1 S980 049253

317 N 028
S791 705028
1 S980 049254

317 N 029
S791 705029
1 S980 049560

317 N 009
S791 705009
1 S980 049276

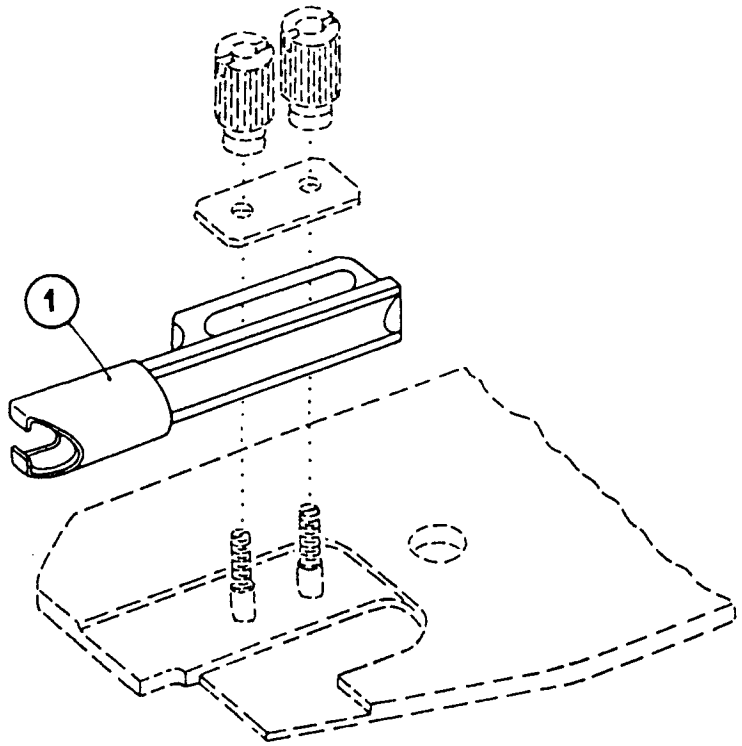
317 N 011
S791 705011
1 S980 049301

317 N 024
S791 705024
1 S980 049625

317 N 012
S791 705012
1 S980 049278

317 N 013
S791 705013
1 S980 049302

tab. 29



317 - 101

317 N 014
S791 705014
1 S980 049306

317 N 015
S791 705015
1 S980 049307

317 N 017
S791 705017
1 S980 049437

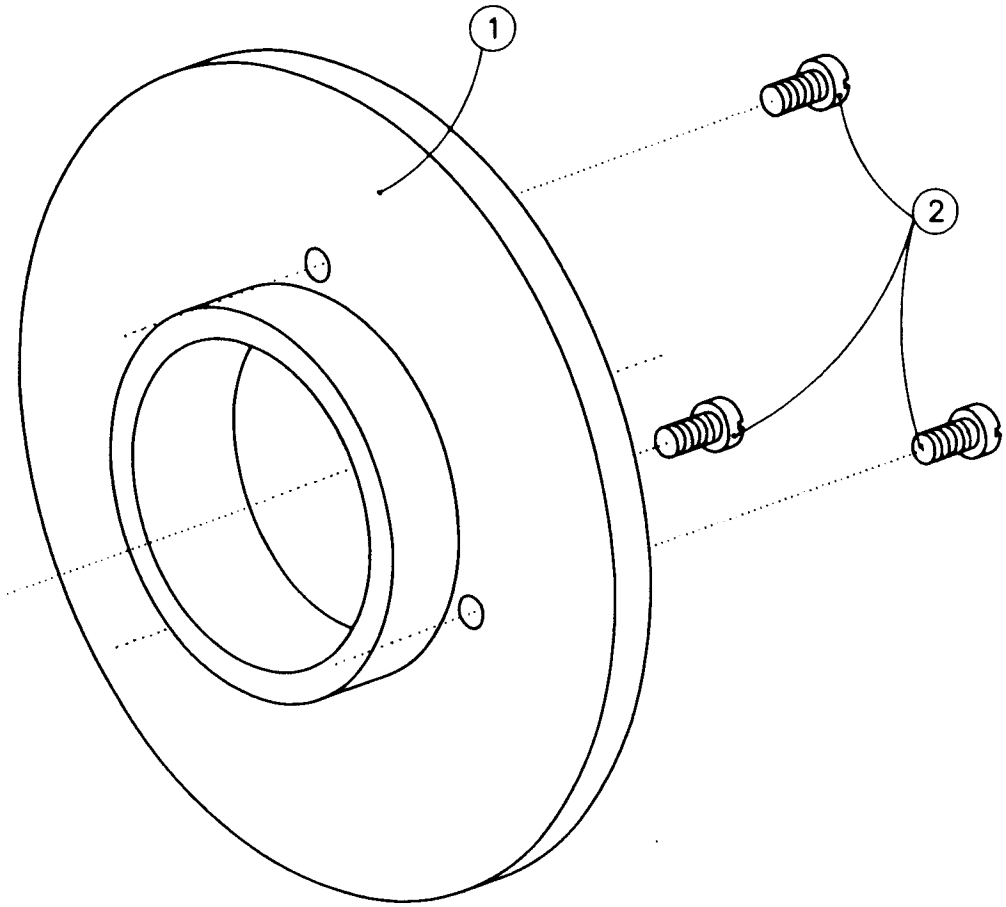
317 N 018
S791 705018
1 S980 049308

317 N 019
S791 705019
1 S980 049280

317 N 022
S791 705022
1 S980 049277

317 N 026
S791 705026
1 S980 049626

tab. 30



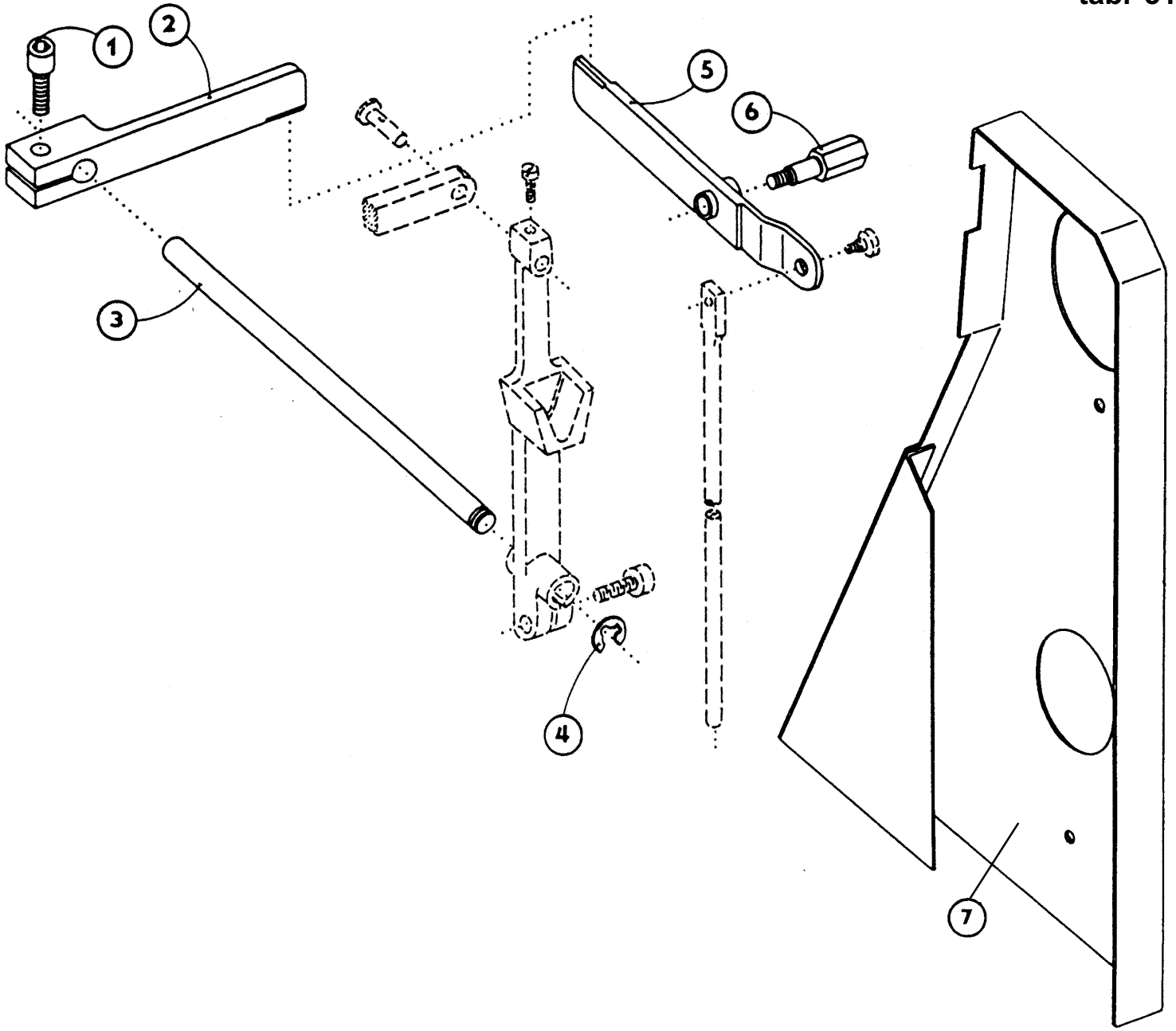
317 - 101

Z066

S791995066

1	S080	511109
2	S080	120352

tab. 31



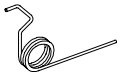
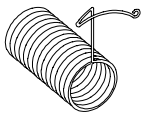
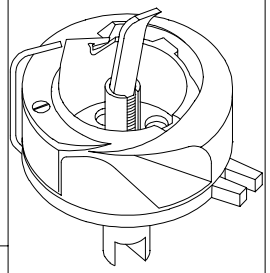
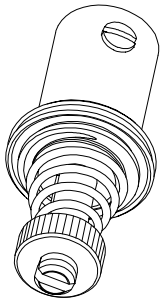
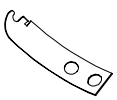
317 - 101

Z074

S791995074

1	S080	120295
2	S080	635271
3	S080	343096
4	S080	274097
5	S980	057211
6	S080	120550
7	S980	057212

tab. 32

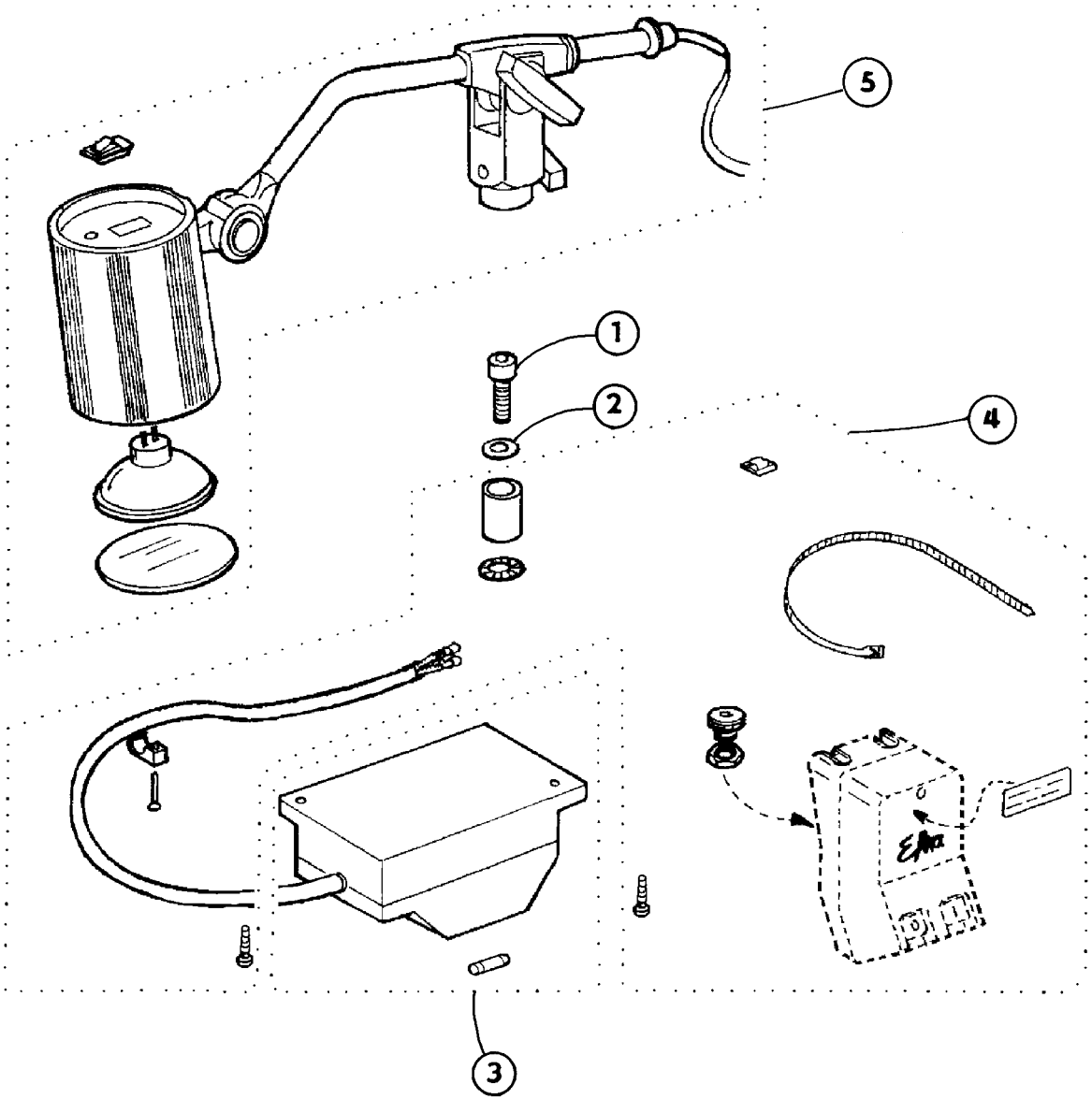
5x S080 120014	3x S080 141088	5x S080 123117	3x S080 265037	3x S080 120530	5x S080 126110
5x S522 000006	3x S080 120410	3x S080 120342	1x  S080 264243	3x S080 124050	
3x S080 122029	5x  S315 264294	1x  S522 000235	1x  S980 025244		
	3x  S522 006008	5x S522 006010			

317 - 101

317 Z 109

S722 73010940

tab. 33

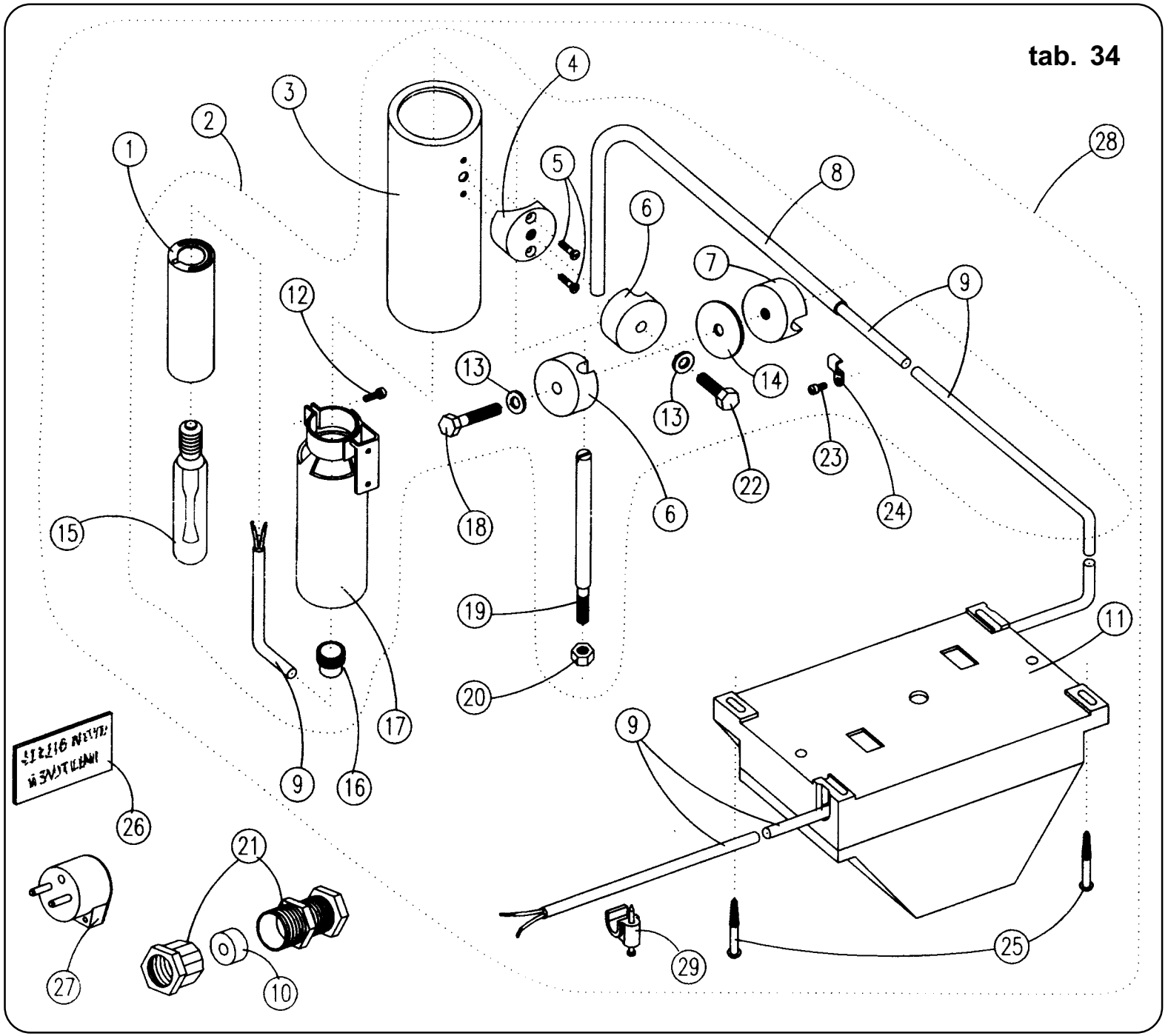


317 - 101

Z 012

S794 222012

1	S080	120692
2	S080	190346
3	0798	500088
4	0907	487519
5	9822	510001



317 - 101

Z 011

S794 222011

1	S345	008000	
2	S980	091660	
3	S080	831506	
4	S080	441501	
5	S080	126085	
6	S080	441502	
7	S080	441570	
8	S080	841541	
9	S341	028052	
10	S345	201000	
11	S980	091814	
12	S080	120279	
13	S080	190347	
14	S080	839169	
15	S347	002000	
16	S321	001000	
17	S980	057091	
18	S080	141154	
19	S080	330088	
20	S080	161163	
21	S273	006001	
22	S080	141265	
23	S080	120261	
24	S080	824095	
25	S080	225018	
26	S735	975176	
27	S345	620040	
28	S980	091816	
29	S345	005000	8 x